

Final Degree Project

# **BibApp, Creation and development of a business plan and design of an application for libraries occupancy**

## **REPORT**

**Author:** Natalia Gimeno Vidal  
Alejandra Ponjoan Jiménez- Ridruejo  
**Director:** Joaquín Fernández Sánchez  
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Escola Tècnica Superior  
d'Enginyeria Industrial de Barcelona





## Summary

Nowadays technology progresses at an unprecedented rate. One of the most important technologies we use at the day of today is the smartphone, and more specifically, smartphone applications. The latest generation of these smartphones comes with an immense variety of applications to get you started, from email and photography editing to navigation, or weather and health services. However, every one of those default apps has at least one alternative on the app stores, and often, there are a dozen more that can represent a huge upgrade. Amongst the many applications that are offered to us daily, the ones that offer a service based on the location of the user are gaining popularity.

The following report embraces a precise and complete recapitulation of the all the work fulfilled during this project. Its principal goal is to enter in the applications market with a new idea, trying to fill what we have seen as a little hole in it.

As students, we realised there was one problem almost every student in the world has faced at least once: not finding a seat when he/she goes to a library to study. In this present work a solution to this problem is proposed. This solution is called BibApp. An app that can tell its users the occupancy of all the libraries in the city in real time and provides the user with a lot more useful information about the libraries. The app uses a map and the localization of the user to try to provide him/her with alternatives to the fully occupied library he/she wanted to go to.

For that matter, we have analysed the state of the art of the necessary technology to implement our solution. Later, we have conducted a market study of the different initiatives that exist or have been in the market and that can be used as an inspiration for the development of BibApp. Finally, we have designed the application and detailed the business plan of our project.





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# 1. Glossary

- CFPS = Higher level Training cycle
- CFGS = Higher level Training cycle
- APAC: Includes all countries in South Asia, East Asia, Southeast Asia, Australia and New Zealand.
- EMEA: Includes all countries in Europe, the Middle East and Africa.
- Americas: Includes all countries in North and South America.
- OECD: Organization for Economic Cooperation and Development
- CEO: Chief Executive Officer
- CFO: Chief Financial Officer
- CMO: Chief Marketing Officer
- ISO: International Organization for Standardization
- QR: Quick Response Code
- SEO: Search Engine Optimization
- API: Application Programming Interface
- NPV: Net Profit Value
- IRR: Internal Rent or Return
- LBS: Location Based Services



## 2. Preface

### 2.1. Project Origin

Nowadays, it is very common to study in a library instead of staying at home. It is believed that this is due to the fact that in a library you can study with other people so you can ask questions and be accompanied by others. Young people sometimes think that they concentrate better in a library rather than at home.

With this tendency of studying in a library, a drawback that almost every student had to face sometime in their student life, is not finding a place to study because the library occupancy is full. Going in to a library without being able to find an empty sit and having to go to somewhere else is a big waste of time for students which are in exam period.

Unfortunately, there is a bad distribution of the libraries occupancy in Barcelona. There are a few neighbourhoods with more occupancy than others. This problem is more critical during the weekends when most of the libraries are closed or their opening hours are significantly reduced. That is why a lot of libraries are full and students must go home after not finding a place to study. Despite this fact, there are some libraries located in small neighbourhoods or not common that are opened and not full but they are rarely known. There are a lot of libraries that during Christmas holidays are closed, when it is a time of the year when most of the students need to study in order to face their exams in January. In these months the few libraries that are opened such as the Pompeu Fabra University library are collapsed.

The idea is to develop an App to avoid this waste of time providing information of all libraries around Barcelona of the library opening hours, location, whether it is private or public and the most important and innovation field: the occupancy in real time.

The aim of this project is to avoid unnecessary commutes in order not to waste time, and promote libraries that are not very common but actually opened, not full or closer to students' residences for improving the study environment in libraries.

## 2.2. Motivation

The main motivation of this project is the challenge of developing an App. The use of Apps is everyday being more common for a big part of the population. Another incentive is the benefit that can bring to students, provide people with an App that gives information about libraries occupancy around Barcelona, making saving their time with commutes that are needless because the library is already full. It is the idea of providing a service very useful and with great value for the users which makes the idea very appealing.

In Europe, 78 out of every 100 inhabitants own a smartphone. At global level, the number of mobile devices is higher than the number of population, being this number 7.900 million. The beginning age of their use is every time earlier. These numbers help to understand the importance that smartphones have been acquired in our daily lives.

In this context, a lot of applications are being created. They center their business plan in selling through apps, due to the fact that it is cheaper than physical business. Entrepreneurs do not see as difficult as before trying their business ideas and launch in the market with new apps.

Based on the predictions made by the specialized in apps consultant, App Annie, the outlay from users in applications will rise around 30% in the upcoming year 2019 regarding the results achieved this year, nothing less than 110 billion. They published a report that predicted an increase of 380% from the sector between 2016 and 2021.

The mobile app economy was worth \$61.8 billion in 2016, and the forecast for 2021 is that the global spend grows at 18% to reach \$139.1 billion. The figures vary slightly from researcher to researcher but the fact is that mobile is really big. Revenue is generated through in-app purchases, in app-ads, and big data accumulation. The most promising sections are social networks, utility, advertising, and productivity. The fastest growing markets are APAC (Asia-Pacific) and Latin America.

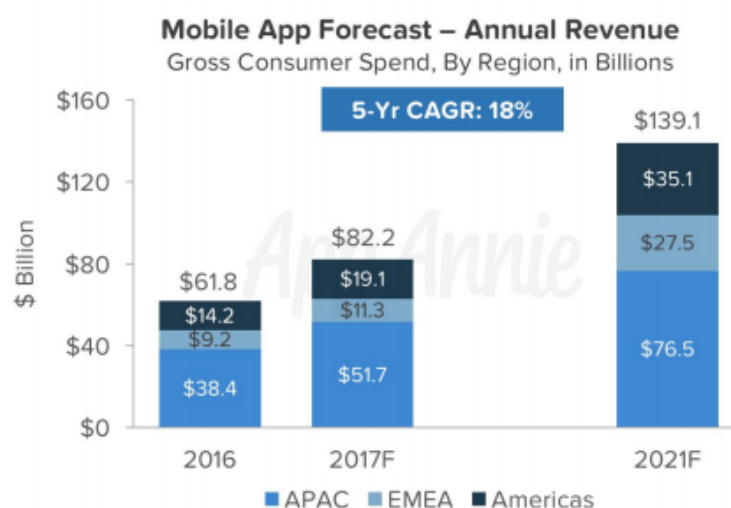
Revenue in the Americas and EMEA will nearly double over the next five years from 2016 levels, but both will be outpaced by the growth in APAC. Revenue generated per device will grow from \$15.42 in 2015 to \$16.22 in 2020, with growth being driven by existing smartphone users in mature markets. And even though new smartphone owners will generally come from lower income brackets, mobile will continue to capture

more and more of consumers' share of wallet, driving revenue per device up in the Americas, EMEA and globally.

And even beyond the store revenue for mobile apps, there will be explosive growth in mobile commerce and advertising revenue. There will also be a growing contribution from apps as they expand into new platforms, namely wearables, TVs, virtual and augmented reality (VR and AR), home Internet of Things (IoT) and automotive.

Mobile app business is powered by three models – paid (59.5%), in-app purchase (30.9%) and advertising (9.6%). Originally the app ecosystem debuted with the paid model and, as it can be seen during 2011-2012, the total revenue was doubled, from \$7,1 billion in 2011 to \$15,4 billion in 2012 but since the following year and on it is seen a rapid decline, the revenue leveled on \$3,9 billion a year on average. The reason for revenue, driven by paid model, to decline was in-app purchase model introduction. With in-app purchase mobile app users could install an app for free, try it to see if it is something they really need and later pay for additional functionality or to remove ads inside an app. Over the years this in-app purchase advantage allowed this model to outgrow the paid one.

The number of mobile phone lines, overcame for the first time the total of global population in 2016, a tendency shown toward the rise that was consolidated in 2017. The penetration of mobile telephony reached in 2017 the 103.5 lines per hundred of the population, which represents 7740 millions of subscriptions. This services is more extended into developed countries (127.3 lines per hundred of the population) than emerging countries (98.7), although undeveloped countries are the ones that hoard the vast majority of distributed lines, in detail eight out of ten.



Graphic 1 Mobile App forecast of Revenue. Source: App Annie

The estimated number of mobile app developers is 2,3 million, which means that one developer out of eight is dealing with mobile apps. Apple, during its Worldwide Developer Conference, talked about 1,25 million apps in the App Store accounting for 50 billion downloads and \$5 billion paid to developers last year. The average revenue for a developer is shown in the table below.

	Google	Apple	Microsoft
Number of users (in millions)	900	600	12
Number of apps (in thousands)	800	1250	160
Number of developers (in thousands)	150	235	45
Number of downloads (in billions)	48	50	.65
Paid to developers (in millions)	900	5000	100

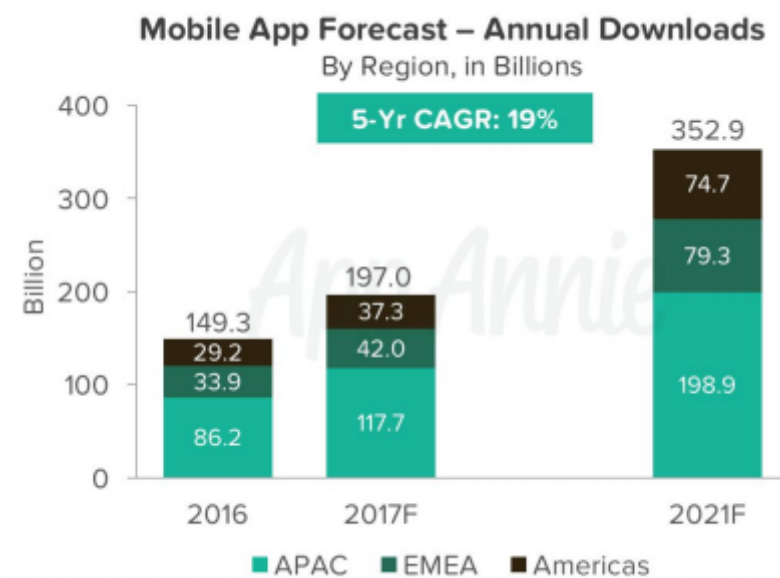
  

	Google	Apple	Microsoft
Average revenue per app	\$1125	\$4000	\$625
Average revenue per developer	\$6,000	\$21,276	\$2,222

Tabla 1. Mobile app developers. Source: Business of Apps

It is expected that app downloads would grow to 352.9 billion in 2021 when in 2016 where 149.3 billion. The transaction value for global mobile payments it is projected to grow from \$235 billion in 2013 to \$930 billion in 2018. The main trigger behind rocketing mobile app usage is the growing sales of tablets, smartphones and other mobile devices. Also, this growth will primarily come from smartphone adoption in emerging markets, as prices continue to fall to feature phone levels.





Graphic 2 Mobile App forecast of Annual Downloads. Source: App Annie

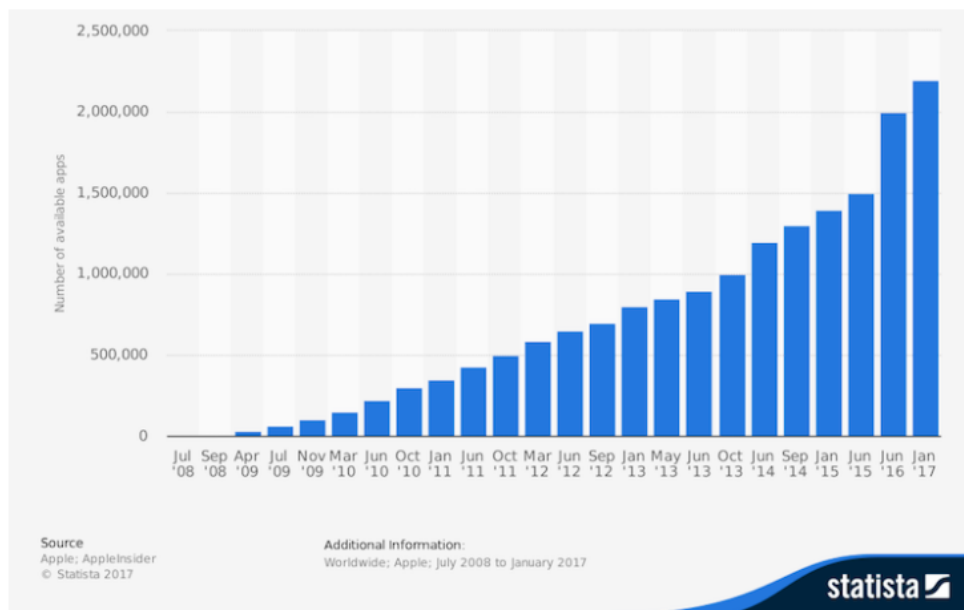
Undoubtedly, apps or third-party applications for smartphones, launched initially by Apple, are responsible for the revolution on users' digital life.

In 2017, in the principal national markets of mobile telephones, including Spain, users used an average of 30 apps per month for handling the dozen of task that monthly make and more than 9 apps per day. Although, the consumed time in its use vary considerably between countries, from 3 hours per day (South Korea) to one hour and a half in France, without forgetting that 20% of most active users, comes to exceed 4 hours per day.

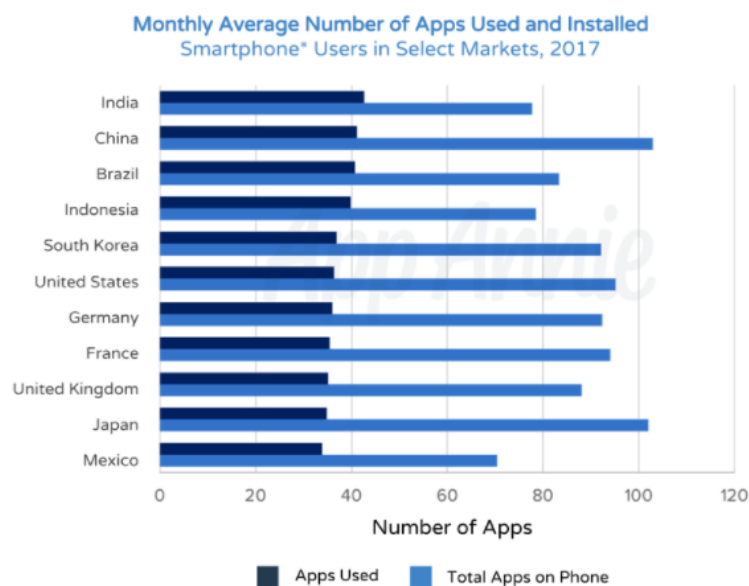
In many areas, the usage of apps has become in an essential necessity for users.

In addition, monetization models will continue to evolve and expand beyond in-app virtual goods. Thanks to the shift of media consumption to mobile devices, subscription models have been gaining steam in developed markets; it is expected this trend to accelerate in the coming years. In emerging markets, smartphones have allowed many to experience the Internet for the first time, which has led to exponential growth in mobile commerce.

### Number of available apps in the Apple App Store, 2008-2017



Graphic 3. Number of available apps. Source: Statista



Graphic 4. Number of installed Apps. Source: App Annie

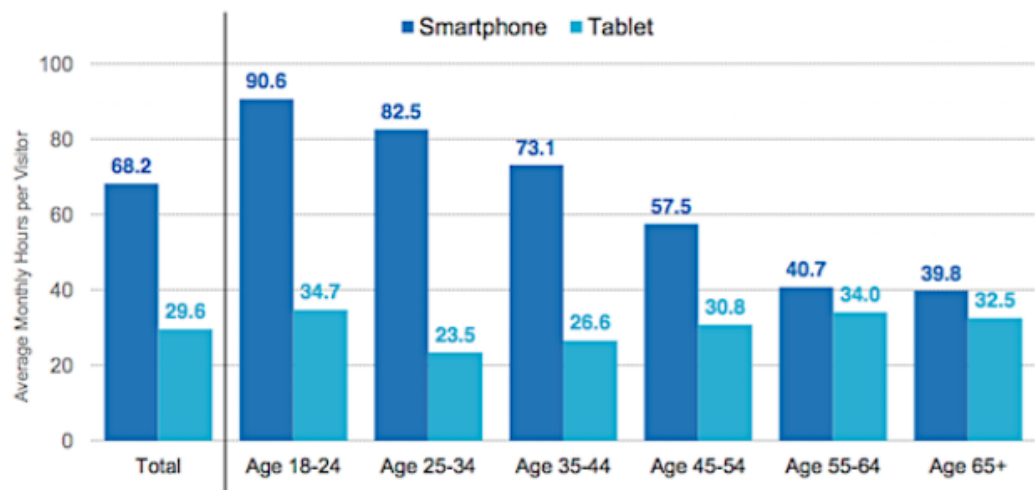
The growth is evident in all app categories. It is clear to mobile researchers that mobile apps are turning into huge distribution channels themselves, rather than staying as independents instruments of marketing communication. The reach, the frequency, and the retention rate are fascinating for mobile apps.

It is significant that mobile app usage dominates the overall time spent on daily media consumption at 82%.

The numbers from 2017 certainly inspire confidence. Apps are increasingly becoming the go-to resource for communication, entertainment, shopping and productivity. As a result, there's been a 60% growth in the number of app downloads globally, consumer spend has more than doubled, and time spent in apps spiked by 30%, to the point where each user spends about 43 days per year in apps.

This dramatic shift is a result of enhanced services and engaging interfaces developed for the app ecosystem.

**Average Monthly Hours per App Visitor by Age**



Graphic 5. Monthly hours per App visitor by age. Source: Business of Apps

Age 18-24 is the age group that spends the greatest amount of time on mobile apps. This group of people is our target, the group of consumers that best fits what it is offered.

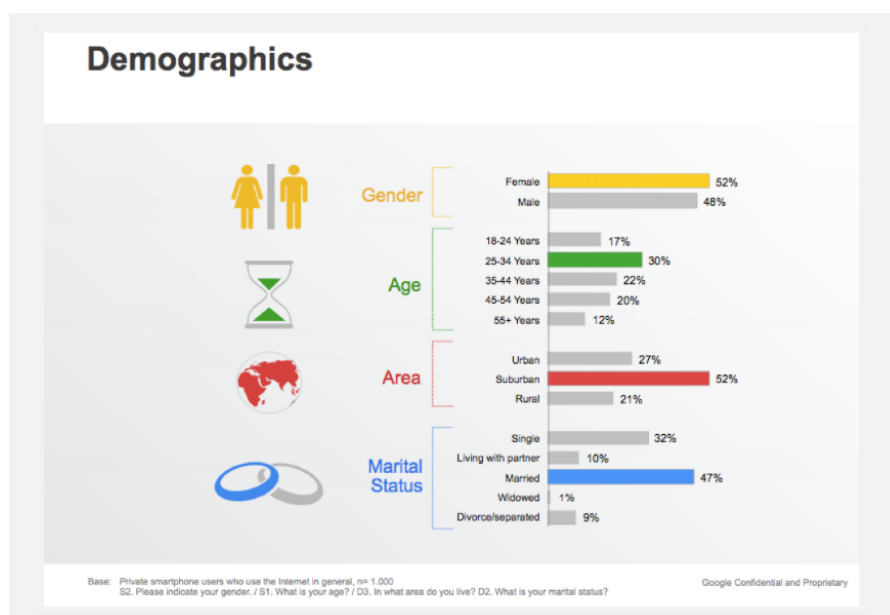
Mobile advertising has tremendous untapped potential as mobile owns 24% of time spent in media, but just 8% of overall ads spend. And as time spent in mobile apps continues to climb, this gap will close, driving billions more in mobile advertising revenue. Furthermore, while performance advertising already plays an important role in driving many publishers' revenue across the globe, as people spend more time in apps across more screens and as brand advertisers come to apps, the app economy will

explode even further.

Furthermore, now that apps have reached critical mass via smartphones, they are expanding into new devices. Apple and Google are driving development of optimized apps for VR, wearables, TVs, smart home devices and cars. Clearly not all app types lend themselves equally well to all device form factors. And conversely, these new devices will redefine apps and their utility. It is believed the smartphone will remain the anchored center of this connected universe for as far out as it can be seen, while these newer devices pave the way for app interaction in a broader array of contexts.

We are only in the early stages of the app market's maturity cycle. Apps are set to become the most important interface between consumers and businesses as mobile consumes more of our time and as apps expand into new device platforms. Mobile apps have already dwarfed previous computing revolutions and we can look forward to even more growth ahead for the app economy.

Who can be reached through mobile apps?



Graphic 6. Who can be reached through mobile apps 1. Source: Pew Research Center



Graphic 7. Who can be reached through mobile apps 1. Source: Pew Research Center

The 86% of young people possess a smartphone and uses as a reference device for instant messaging (81.7%), social network access (77.5%), music usage (65.2%) and videos on streaming (52.2%). According to Global Web Index, in 2018 it is foreseen that 50% of young people are mobile first, that is to say, that consume from 90 to 100% of their time networked on one mobile phone screen.

In Spain, 80% of people use smartphones to access the Internet every day, and the majority will not leave home without their phone. As the PewResearch Internet Project indicates, about half of all cell phones users have mobile apps installed, and two-thirds are regular mobile app users. Mobile app users are generally younger, more educated, have higher income in comparison to other cell phone holders.

Business that integrate mobile into their strategy can engage an entirely new type of customers, an instantly connected one.

Smartphone users generally prefer to multi task and be on the go. Users who can reach through mobile apps are more engaged and ready to communicate with the baseness as long as the channel of communication is accessible and they can find all the product info needed.

Apps have become the primary to engage with media, brands and ultimately with each other. They are the digital interface through which we live, work and play. As a result, the strategic

importance of the app market spans well beyond gaming and media industries. Now all companies need to view themselves as app publishers irrespective of their mobile strategy. Apps drive engagement and brand loyalty and can be monetized directly through app stores, advertising, commerce or any combination of the above.

Smartphone sales in developed economies like the United States, United Kingdom and South Korea will primarily be driven by replacements, with some installed base expansion at lower income levels of the population.

### **Apps Are Eating the Web**

Apps have not only subsumed the delivery of online services but have done so in a way that delivers value and delights users. Equally important, apps leverage amazing technology advancements. These include a multitude of sensors unique to this highly personal, nearly always-on “appendage device” used in ways that were never possible with the PC.

### **Behavioral Shifts and Macroeconomics**

Increasingly, consumers rely on apps for entertainment, social networking, banking, commerce, education, and even government and social services. Some of these services may have migrated from physical or digital channels, while others have been designed specifically for mobile. One example is banking apps, which have allowed customers to take advantage of biometric security available on millions of smartphones ahead of other platforms like the PC and even ahead of the banks’ own automated teller machines.

A deceleration in overall consumer spending will likely delay device upgrades and extend replacement cycles for existing device owners. But even if this slows the growth in device installed base, we expect little impact on revenue per device due to the resilience of app-driven services. Multiple factors bolster this. First, app store spend constitutes a very small share of overall consumer spend and, unlike larger purchases, is not likely to be meaningfully affected by economic headwinds. Second, economic activity is continuing to migrate from other channels, including the web and physical world, onto apps. This service migration will lead to growing consumer spend on mobile apps even if overall spend declines.







## 3. Introduction

### 3.1. Project target

The main target of this final degree project is to study the viability of the creation of a system to inform the students about libraries occupancy in real time. For that matter, we will design a business plan of a company that supports it and we will carry out the design of the platform in which the company will sustain.

The objective of the platform is to provide a new service that is not fully developed nowadays. This service will allow the students to know not only the occupancy of the library where they want to study, but also the occupancy of all the libraries they may have at their disposal. Thus, it will allow them to decide where they want to go study or work. With the simplicity and velocity of the application's interface students will be able to satisfy their needs immediately.

In personal terms, the main goal of this project is to learn more about the creation of a start-up, market studies, marketing, business analysis, financial plans, the design, its qualities and why it has to be validated. With the project we aim to obtain all this knowledge and combine with the one we already have from our degree in order to properly complete the Business Plan and the design of the project.

#### 3.1.1. Other goals

Below, we explain the secondary objectives that are expected to be achieved during the execution of the project:

- Create, define and design in a complete and comprehensible way, the functional design of a useful tool that the user can implement in the real world. Simplicity and efficiency will be key for the platform's success.
- Create a business plan which can be used to sell our business proposal. It is important that this business plan also enables us to evaluate the functioning of the company.
- Define in a clear and concise way the service we aim to provide, to who will be this service be addressed and the needs it will help satisfy.
- Study the viability of the company.

### 3.2. Project scope

This project is divided into three different parts: the first part is the one where we evaluate the state of the art of the necessary technologies for developing our platform. We also analyse the various projects that compete nowadays in the market. The second part, is where the Business Plan is developed and the third one is the part where we design the aspect and the functioning of the platform if it were to be developed.

The proposed application will be produced and commercialized by a fictitious company that will allow us to evaluate the viability of the proposed solution. This company will be the one managing our user's community and the one carrying out the implantation and the operational maintenance of the system.

The challenge is focused on providing students with a useful tool with which they cannot only save time and unnecessary trips to fully occupied libraries, but also help them to know the different libraries they have in their surroundings and thus improve their experience in the library. At first, this service will be implemented in the city of Barcelona, because it is our home town and because we have a better access to information sources, we know in a more precise way how public institutions work and we have a better knowledge of the market. However, one of the next steps to follow once we reach our goals, will be to escalate to a national and international model.

### 3.3. Integration

The principal goal of a Final Project for the Degree in Industrial Technologies is to develop a project that can be somehow related to any subject or knowledge obtained through our years of university. As mentioned above, the main objective of this project is the creation and design of a Business Plan for a mobile App called BibApp. Hence, to establish a connection between the project and ETSEIB courses is necessary.

Here we have some examples of courses related to the project:

- Economy and Business (“Economía y Empresa”): accounting, cash flow and other basic tools needed in every business when calculating expenses, capitalization, revenue, etc.
- Organization and Industrial Management (“Organización y Gestión Industrial”): time and chore management and structure in order to maximize time, productivity and money.
- Project Management (“Gestión de Proyectos”): development of a full project by groups we obtained the first glimpses to what creating and managing a project looks like. The most similar and helpful course for this Final Project.

In addition, this project is not only for the student to pour out his knowledge, but also to learn by ourselves and expand on our understanding of the chosen topic, one that interests us and that moves our curiosity.



## 4. State of art

Once the aim and purpose of this project has been defined, it is extremely crucial to observe in what situation the actual market is nowadays and in what orientation it is heading. That is vital in order to place our business amongst its competitors, do a comparison between them and identify their weaknesses and strengths.

Apart from looking for apps or businesses with the exact same purpose as BibApp, we have noticed that in the application market there has been an increase of apps using maps or the user's location. These are called location-based services.

There are a lot of new apps that are entering the market with the aim of avoiding their users to waste time. Time is the most valuable asset and it is not possible to catch up time. Below is it going to be named a few apps that have the same purpose as ours, not with the same business but the exact purpose:

- Roo: it is a crowd-sourced app that allows its users to check in and report the scene at most nightlife venues. The way the app works is that whenever you're in the vicinity of a "roo-ported" bar—the venues are pulled from a venue API but they would eventually want to crowdsource the data—a notification will pop up on your phone asking you how it is. Then you rate it on a scale of "Lame" to "Awesome"; also, is it packed or empty, or, more importantly, is there a tough door or long line? This app was created with two purposes: one to inform users about the best bar to go one night, knowing how crowded the bar is, if there is a line to enter, the bars environment, etc. And another one that ties it with our app is that avoids people wasting their time going to a bar that is empty that night, already full or with a long waiting line for entering.

Report real-time bar conditions  
when you arrive.

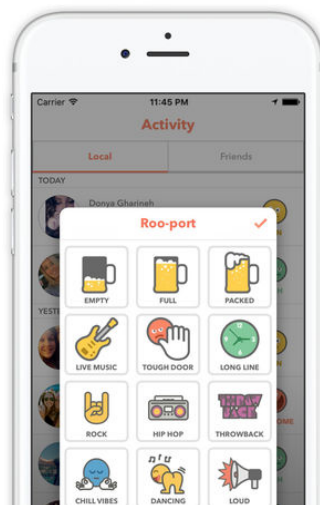


Image 1. Screen of Roo, the application

- SceneTap: the idea of the app is the same as the one explained above, this app provides Android and iOS user's information about the different clubs in different cities. The startup will be tapping into an infrastructure of cameras spread across an untold quantity of bars. The goal of this app is to provide a real-time snapshot of what the demographics are at any location on any given night. Providing this information, ScenTap will help users to decide where to go. For not to invade people's privacy, no actual recording is going on, and each person is tracked anonymously.





Image 2. Screen of SceneTap, the application

- IEM: The Presto sense sensor for improved city center mobility. With the steady growth in urban populations, cities have to adjust to the increase in vehicle traffic in the resulting air pollution. In smart cities local authorities are using new technologies to make life easier for their citizens... The sensor's dual detection system now delivers incomparable reliability. Every two seconds it triggers a measurement of the Earth's magnetic Field. When a metal object moves in the sensors vicinity it triggers the ultrasonic sensor to perform a second detection to confirm the presence of the vehicle. The status change of the parking spaces is transmitted to the IEMs platform in real Time, over the Laura when telecom network. The occupancy data collected by the sensors is used to design key on street parking indicators for a given zone. 30% of inner city traffic consists of motorists looking for somewhere to park, cutting down on the time taken to find a parking space can considerably reduce co2 Emissions. Because presto sense sensors detect free parking spaces in real time, they help motorists optimize their Routes.

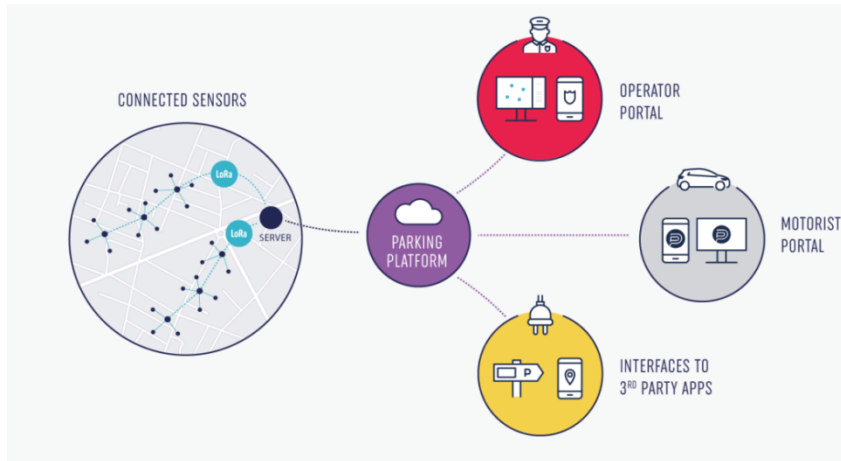


Image 3: How IEM works

- **HIKOB:** HIKOB provides vehicle detection and parking places occupancy monitoring systems for urban or private parking, commercial surfaces parking or on street parking. The wireless system for vehicle detection provided by HIKOB includes energy autonomous and wireless sensors deployed on each parking place. They detect the presence of a vehicle parked on a place with a magnetometer sensor that is measuring the magnetic field variations generated by the metallic body of the car. The wireless sensors are buried in the road pavement and communicate detection data through HIKOB wireless acquisition network. The cornerstone of this local network, HIKOB GATEWAY provides both the connectivity with the Internet network (wired or cellular) for remote data transmission, and also with on field information equipment if needed.

These four applications mentioned above, are a few examples of the many apps that are now being design to offer a service for citizens, in this case for avoiding wasting peoples time.

For this reason, among others, it is believed that Bibapp it is being developed in the perfect time, and that people are going to want to use it, as same as the four example apps.





## 4.1. Location-Based Services

Location Based Services or LBS are generally applications that offer personalized services in real time for the user basing on the geographic localization of his/her device. The success and the emergence of a great quantity of LBS is not casual, location-based searches are one of the features that awake most expectations among Internet users, and especially among users of mobile devices.

A crucial piece of the mobile experience is location data. It capacitates some of the most generally used mobile apps. Theses apps can be used for geo-social networking, travel and navigation, retail and real state searches, and mobile advertising and marketing.

Whether if they are used for locating friends in a determined area, finding the nearest restaurant or advertising deals to shoppers who are in the neighborhood, location-based services (LBS) allow users access to significant and valuable, up-to-date information about their surroundings and enable businesses to contribute with current updates to their customers. All these characteristics offer a dynamic user experience, providing a new level of convenience that changes the way businesses interact with customers and other enterprises.

When speaking of location-based services, we can find two scenes in the evolution of commercial location services. These two stages have been location enhanced applications, such as local information like the closest pizza, and location-based applications, such as navigation, in which the location of the user is intrinsic to the application.

Formerly, location arguably made the application better. However, the application could stand by itself. On the other hand, nowadays, there are loads of applications that only make sense with location. Major improvements in accuracy, reliability and the services that can be delivered have been brought by the advancement in Hybrid location technologies. Due to these advances, LBS were increasingly being deployed in mission-critical applications such as guiding emergency services directly to a caller.

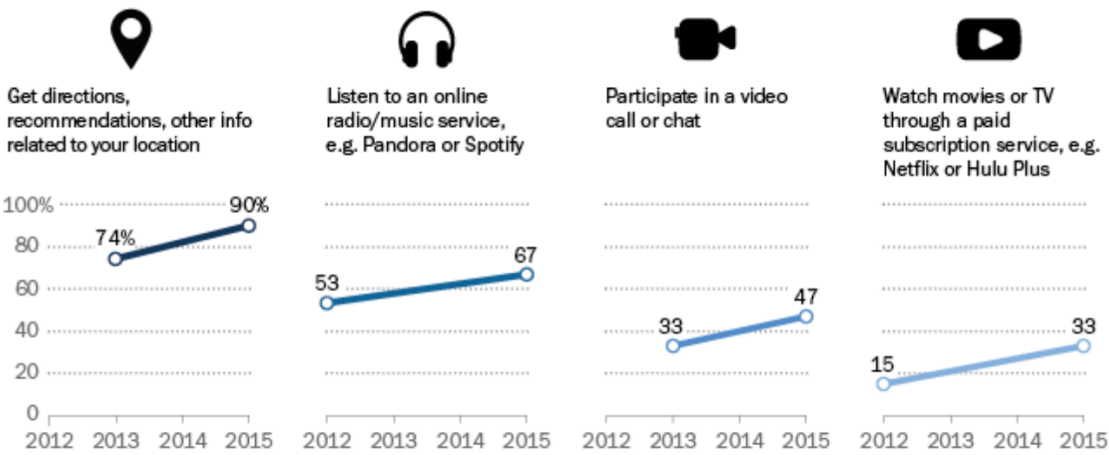
### 4.1.1. LBS past

In between the smartphone activities measured, getting location-based information is the most universal task. Nine-in-ten smartphone owners use their phone to get directions,

recommendations or other information related to their location, up from 74% in 2013.

### Americans increasingly use smartphones for more than voice calls, texting

% of U.S. smartphone owners ages 18 and over who have ever used their phone to ...



Graphic 8. Use of smartphones in America. Source: Pew Research Center

Younger adults are especially likely to reach for their phone for something other than calling and texting. Getting location-based information is the one activity measured that is common across all age groups.

These days, younger adults are more likely to reach for their phone to do something different than calling and texting. Getting location-based information is the one activity measured that is more common across all age groups.

#### 4.1.2. LBS future

One of the upcoming trends or tendencies gaining traction in the market is the increasing popularity of cloud-based big data analytics. Big data analytics provide enriching insights on consumer buying patterns so that the retailers can increase their sales volume and enhance customer search experiences. Location-as-a-Service companies, such as GeoSpice, use big data analytics to offer cloud-based web services and mobile LBS, which can integrate real-time location information and data analytics.

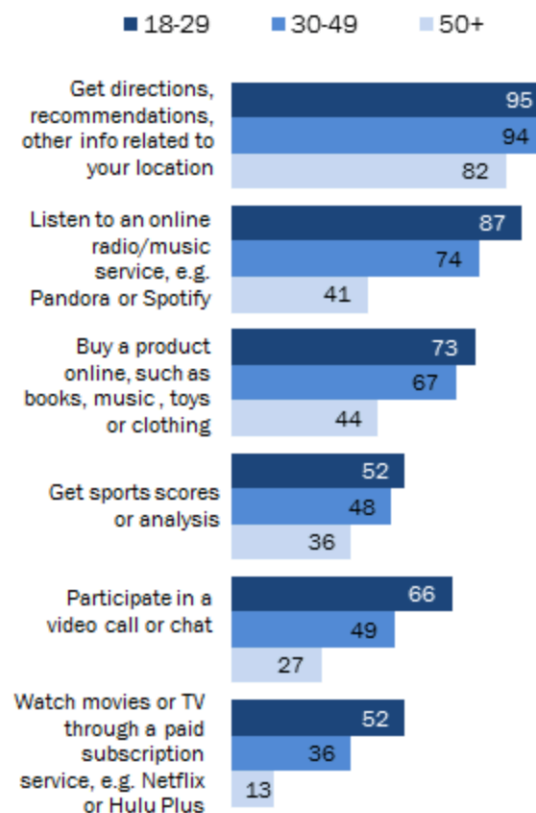
The past analysis shows that the retail companies have dominated the Indoor LBS than



other segments such as hospitals, airport, government agencies, public security, etc. Indoor LBS providers offer coupons and discounts through push and pull marketing technologies. These services also provide social information such as ratings and reviews, product videos, and recommended products, thereby improving the overall shopping experience. In addition, location-based marketing is extensively used across different industries to send product or service promotional messages based on the user location. Many companies use location-based apps for targeted advertisements to reach potential consumers in real time, which will aid in this segment's growth over the next four years.

### Unlike other mobile activities, location-based services appeal to smartphone owners of all ages

*% of U.S. smartphone owners ages 18 and over who have ever used their phone to do the following activities...*



Graphic 9. Activities of smartphone users. Source: Pew Research Center

Some of the technologies that have progressed the most this past few years are digital maps and apps based on localization, which have been acquiring every time a major prominence

in the network. The appearance of different APIs (Application Programming Interface) and services for the creation or integration of these technologies in web sites or applications, has caused a proliferation of products based on them. The accessibility to these products, framed within the denominated Rich Internet Applications (RIA), means a new challenge for web developers.

Moreover, a lot of start-ups have their principal strategy focused on digital maps and on the services based on localization. This is the scenario of searching businesses for tourist accommodation, restaurants, public transport, museum routes and many more.

#### **4.1.3. Platforms for the creation of digital maps and LBS**

Amongst the available platforms that we can find nowadays in the market for the creation of digital maps and services based on the localization, three of them stand out: Google Maps, Bing Maps and OpenStreetMaps.

Google Maps, released in 2005 its API based on AJAX and JavaScript, allowing third-party developers to create new products based on or incorporating, part of their services. The use of the Google Maps API is free, although it has certain "reasonable" use limits, exceeding which, a license must be purchased. It is undoubtedly the most powerful and updated platform of the three highlighted above. The last update of the platform dates from 2017, much more recent than the rest of the alternatives. It also stands out above the rest for its excellent route obtaining service, less developed and with less coverage in the case of OpenStreetMaps and Bing Maps respectively, and for the existence of other libraries, APIs or services offered that we can combine with Google Maps. This is the case of Google Places APIs, search autocomplete, static maps, etc. Among the services or resources, it offers, we also find the possibility of using its digital map service, the service of calculating routes on foot, in a private vehicle, in public transport or by bicycle.

With the definitions mentioned above, we consider our application is another Location Based Service. BibApp will use a map and the localization of the user to show him/her the occupancy of all the libraries he/she has nearby.



Although the strongest point of our app and its main purpose is the fact that it will be able to tell the occupancy of a library, in terms of the design of the application, we focus on the fact that it will have a map on display. For that reason, we have chosen different applications that use a map to show the information they offer in order to compare the qualities of the design of these apps.

The applications are:

- Moovit – Transport
- TheFork – Restaurants
- Airbnb – Accommodation
- Wiffinity – WI-FI

### ***Moovit***

This app is one of the most precise public transport apps we can find nowadays. In only one app it combines all the public transport options and it allows you to obtain total control of your journeys in public transport. It enables the user to search the address where he/she is headed and it offers him/her the different options available in public transport to go to that place. It also allows the user to register his/her favourite routes, places, transmission lines, between many other features.

Concerning the use of the map, the application offers the option to check a live map with the user's location displayed, that shows all the stops that the user has nearby. In addition, when the user selects a journey, he/she can see on the map the itinerary and once he/she starts the journey there will be available the live directions the user has to follow in order to meet the itinerary.

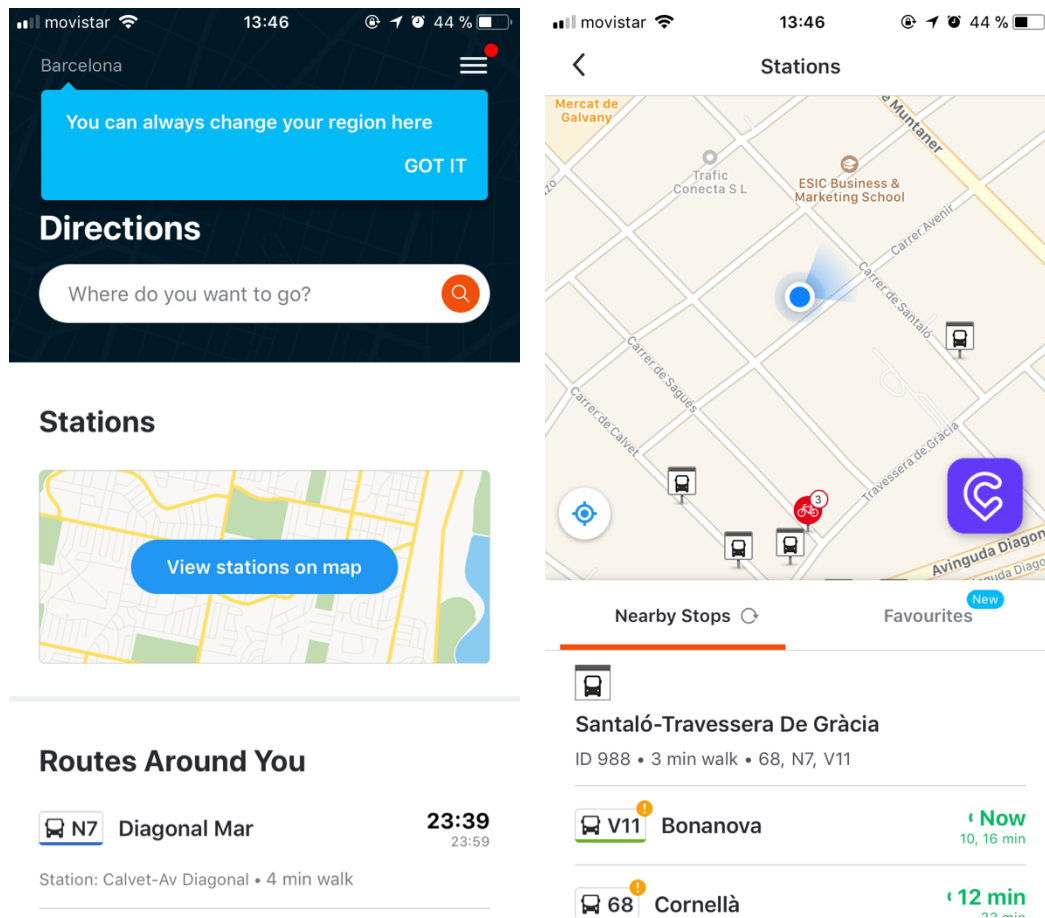


Image 4: Screens of Moovit, the application

## TheFork

It is a well-known restaurant reservation portal that also offers discounts. But their services go even further, this platform is an intelligent book of reservations, which not only allows a restaurant to manage each one of them but also enables it to maintain contact with customers and attend them based on their profiles and needs.

With this app you can search the restaurant you want to go by its name, by the location of restaurants that are around you, by a list of recommendations they offer, by the type of food you want to eat, and so on.

The map is really important in this app because using the user's location, the app shows him/her the restaurants he/she has nearby.



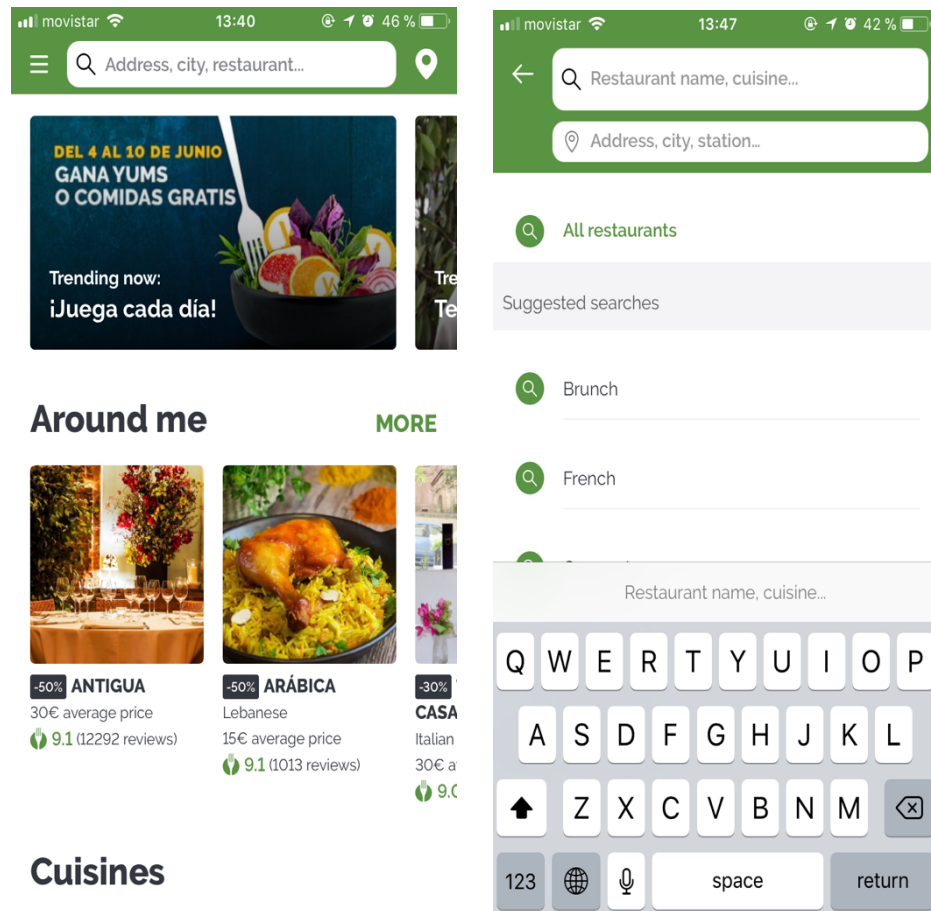


Image 5: Screens of TheFork, the application

## Airbnb

It is a platform that connects people who want to offer their homes for rent, with guests who need temporary accommodation. This app needs different parts to work: the owners of the homes (the hosts), the guests and between them, Airbnb, who creates the contact between the other two parts through his Internet platform.

The host is the person who offers his home for rent. He posts pictures of his home, and gives all kind of information about it such as its location.

The guest is the person who is looking for a place to stay. He searches the place he wants to stay in the app, and specifies information like the total number of guests or the exact date. He can also filter the results to perfectly fulfil his needs. Finally, he has to reserve. For that, the user will have to indicate some other details and pay.

In this case, the map is really useful for the user as it shows all the homes that are available in the place he/she wants to stay.

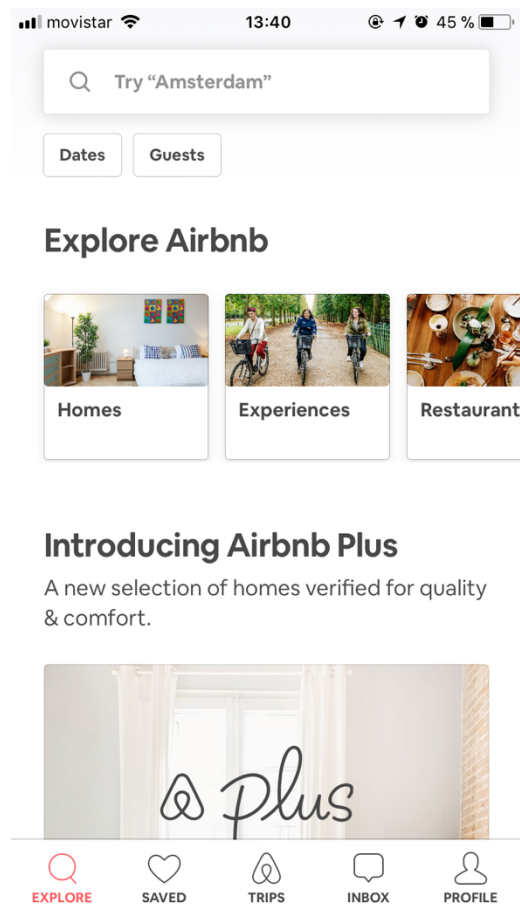


Image 6: Screens of Airbnb, the application

## Wiffinity

This app offers its users a space where they have the possibility of connecting to Wi-Fi signals for free. The thing works in the following way: when downloading Wiffinity the user can access to an interactive map in the app with points that have free access to a Wi-Fi connection. You can adhere to it without any problem and save on your monthly data rate.

The map is the main screen of the application. Once you download it is the first thing you see. Your location and every place with Wi-Fi available nearby you.





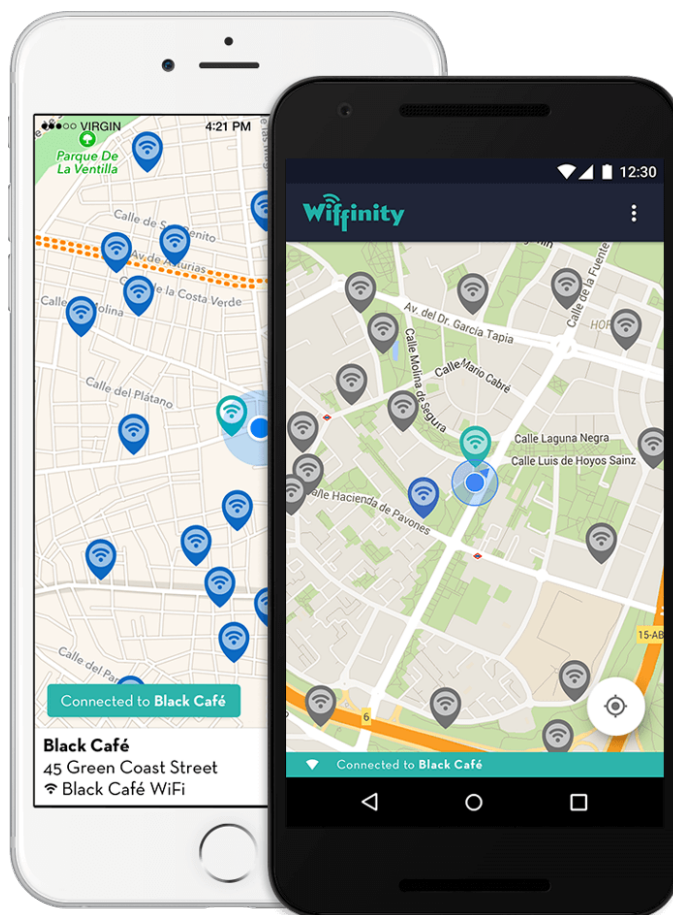


Image 7: screens of Wifinity, the application



## 5. The application design

### 5.1. Comparison of design qualities of other apps

As previously established in the section “State of the art” we have looked at similar applications to make sure BibApp is being well developed. In order to decide in which direction we are heading the design of the application, we have compared some features of the apps mentioned in that section.

These characteristics are:

- The platform: we have considered if the applications are available in more than one operating system.
- The menu: different apps have different types of menus. Nowadays is really typical to have a side pop-up menu or a menu at the bottom or the top of the screen, with every feature of the app available there with icons amongst many others.
- The favourites section: in this apps where the user gets information about places to go, it is very common to find a favourites section. By marking a place as a favourite, the user will have a rapid access to it.
- The map: location based services always have a map, but the way they show it can be very different from one app to the other. In this case we have considered if the map is used as a main screen or you have access to it from other features.
- The search system: again, in a location based service is really important to have a search system. It is truly useful when the user is looking for a specific place to go, a restaurant, public transport, etc.
- The requisites for usage: sometimes there are some requisites for the user in order to use the app such as creating an account, allowing the app to use his/her location, etc.

In the table below we compare the qualities of the different applications we have studied, and we add information about how BibApp is going to be.

	Platform	Menu	Favourites	Map	Search system	Requisites for usage
Moovit	iOS, Android	Lateral	Yes	Yes	Yes	Allow access to location
TheFork	iOS, Android	Lateral	Yes	Yes	Yes	User account
Airbnb	iOS, Android	Bottom	Yes	Yes	Yes	User account, credit card
Wiffinity	iOS	Bottom	No	Yes, as main screen	Yes	Allow access to location
BibApp	iOS, Android	Bottom	Yes	Yes, as main screen	Yes	User account, allow access to location

Table 2. Qualities of the different applications. Source: own elaboration

Other aspects we have taken into consideration when designing the application are its simplicity and easy understanding.

The success of an application is not directly proportional to its high complexity. It is exactly the other way around. Users demand an intuitive and simple interface. A facile navigation based on the design guidelines for the selected platform.

Whatever the functionality, the easier it is delivered, the better, and you will not lose users. That is one of the essential qualities that help popular mobile applications to gather and maintain a loyal following.

That is why we will try to create the easiest and most intuitive system possible to locate what we want within the mobile application. Avoiding the complex and with high accessibility.



## 5.2. Functioning of the application

As mentioned before, the aim of this application is to allow the user to find, in a facile and quick way, the information he is looking for. Obviously, in this case, the information is the libraries' occupancy. In order to accomplish that, the design of the application has been made so it has an easy understanding. And what does that mean? It means the use of the application has to be manageable, simple and intuitive. Otherwise, if the app is complicated, it has a lot of steps to follow and it is not at all instinctive, the user will soon lose interest in it and will find it less useful.

To achieve all this goals, we have drawn to other applications that people use in their everyday lives. Not to imitate them but to make decisions about the design of BibApp by taking into consideration these other apps interfaces. Like that we make sure our application's functioning is easy to understand and follow.

Therefore, and to accurately explain the application's functioning we can say the application is divided in three big parts.

- The map
- The profile of the library
- The profile of the user

Each of this parts and everything related to them is going to be explained in the following section of the project.

### 5.2.1. The map

The map is the main part of the application, followed by the profile of the library. This part is really important as it the principal screen of the application.

BibApp will count on a map showing the location of the libraries the user has in his surroundings. Moreover, like other applications that use a map, the user will be able to see his/her location in it if he enables BibApp to do so. He/she will also be able to enlarge and diminish the size of the map in the screen. This way, the user will be able to choose the amount of information about libraries that he/she wants to see.

The difference between the BibApp map and any other app's map, is extremely relevant. The pointer of each library's location will be either red/orange, yellow or green, emulating the colours of a traffic light, when the user gets close to the library:

- Red/orange: the library has the 15% of its seats or less available, 85% of its seats are taken. When
- Yellow: the library has between 41% and 84% of its seats taken.
- Green: the library has between 0% and 40% of its seats taken.

Moreover, there will be a box with the name of the three libraries that are closest to the user listed on it. Next to the name of the library there will be three boxes, each one painted in a colour of a traffic light and with a number on it. This number is the percentage of occupancy in the library. Each box refers to a different time of the day, being the first one the real time in that exact moment, and the two following boxes, posterior moments. Next to this boxes, there will be a graphic. This graphic will also be following the colour pattern established and will show the occupancy in the moment of the search and in the next hours. By clicking a plus icon situated next to this graphic the user will be redirected to the profile of the library he/she has clicked on. This will also happen by clicking in any of the pointers shown on the map.



Image 8. Statistics status of the libraries. Source: own elaboration

### **How will the occupancy be estimated?**

As it will be later explained, the application will work through sensors. At the doors of every library, there will be placed sensors that are able to count the people entering and leaving the premises. With this number, which will be updated every time someone enters or leaves, and with the number of the library's capacity, it will be possible to estimate with precision the



number of free and occupied library seats. However, we have said that the application will not only inform the user about the occupation of a library at the time of the search, but also that it will offer him/her information about the occupation for later moments. This will be possible thanks to the recollection of data that will be made from the information obtained through the sensors. By means of statistical probability and with the data collected about the occupation at different times of the day, the occupation of the following hours could be estimated.

For further information about the sensors see appendix pages 4 to 27.

### **5.2.2. The profile of the library**

Since the app wants to provide information about the libraries' occupancy, the information about the library itself becomes really important. For that matter, each library will have its own profile, with plenty of information about it.

This information will be:

- The name of the library
- An estimated number of the available seats in the library. Calculated by the capacity of the library and the number of people calculated by the sensors
- The same box showed on the map, but only with the information of the library in question
- The exact location of the library, its address.
- Opening hours
- A telephone number, if the library has it available
- A website, if the library has it available
- An email contact, if the library has it available
- The option to add or delete the library from the user's list of favourites.

In addition, and that will be the most important information, an estimated number of the available seats in the library, that BibApp will suppose from the capacity of the library minus the people inside of it (calculated with the sensor). Again, as in the map there will be the statistics box, but only with the information about the library in question.

### 5.2.3. The profile of the user

This is one of the third big parts of the application. As in many other applications, the user will have his/her own profile, with information about him/herself and other features that will be expounded on later.

As introduced above, each user will have an account.

In order to be able to access the service that the application offers, the user will have to sign in his/her own personal account. If it is the first time the user accesses the application, he/she will have to create a new account pressing the corresponding button in the initial page. This process is just necessary one time for each profile, for each account, that wants to be created in our databases. However, if the user has already done the register in our databases, he/she will just need to identify him/herself. The user will have to repeat this process every time he/she opens the application in his Smartphone or tablet after having previously logged out. Otherwise, if the user does not log out, the application will be background activity on the device. Thus it won't be necessary for the user to identify him/herself again.

#### ***Register and log in:***

In order to complete the register, the user will have to fill some mandatory fields with the following information:

- Name and surname
- Email address
- Username
- Password

After having completed this process, the user will have to click the corresponding button to create his/her account.





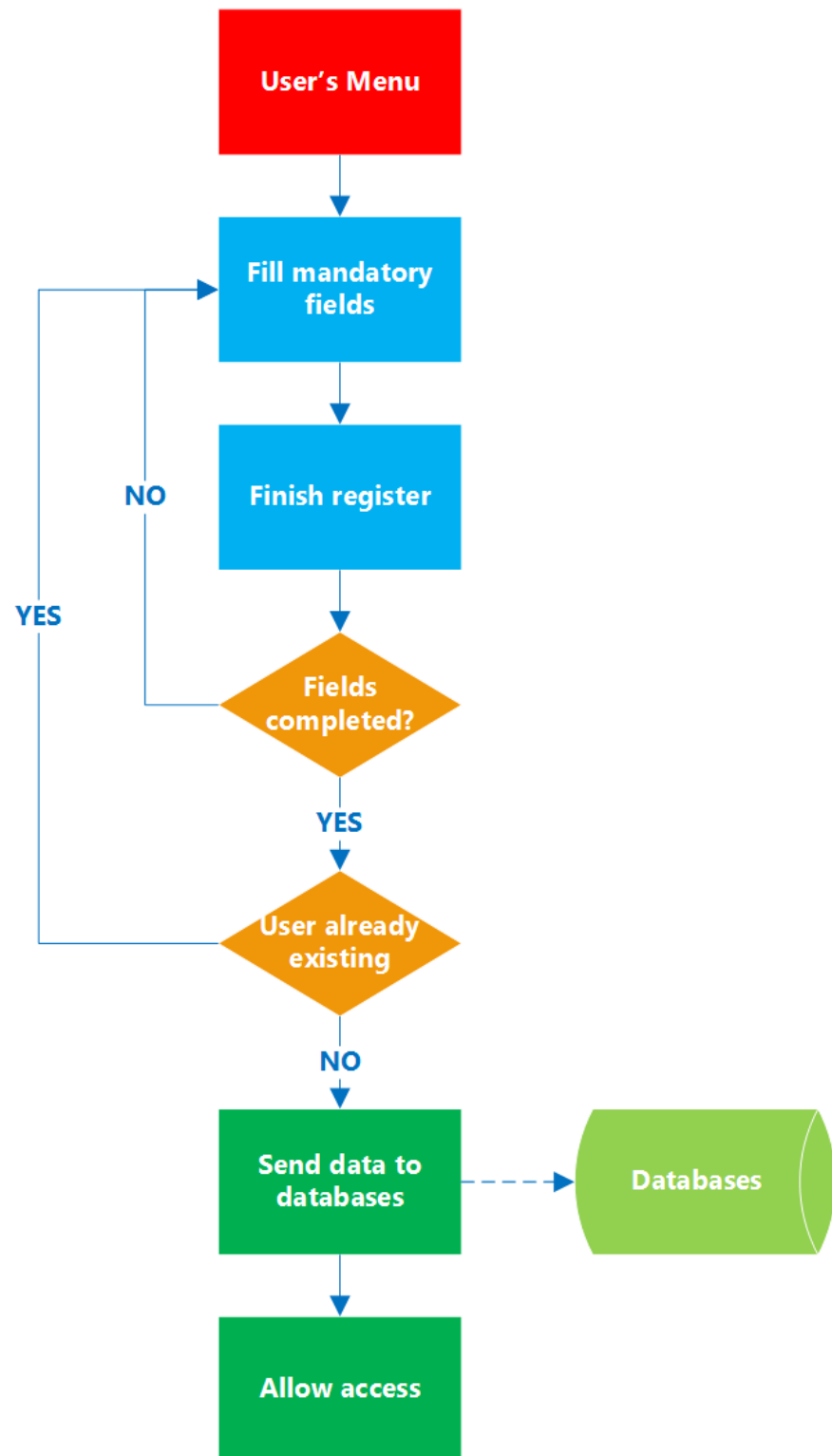


Image 9. New user's register flow chart. Source: own elaboration

Before finishing the register, the app will demand the user to complete some other parameters in order to configure his/her account. Between these parameters we can find

giving permission to the app to send the user notifications about the status of a library or allowing the app to access the user's localization.

Once the register has concluded, if it is confirmed that the data is not from an already existing user, the collected data is added to a data bases of our users and access to the services of the application is given.

The log in process will be even easier. Since the databases stores all the information of each user once he/she has completed the register, each user will be able to log in only by filling these two fields:

- Username or email address
- Password



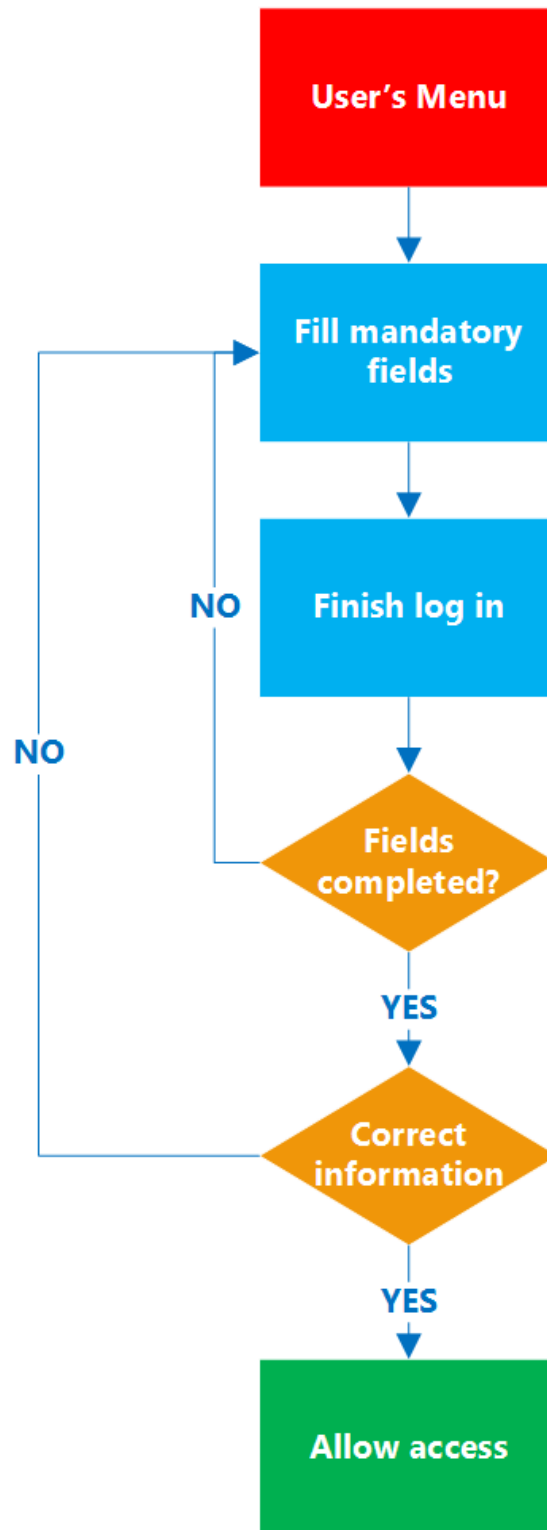


Image 10. User's log in flow chart. Source: own elaboration

Once the user has registered (if it is the first time) or logged in (if he/she already had an account) it is time to start enjoying our services.

As for what the user profile concerns, the application will have available a screen for this profile. This screen will show the user's information such as his/her username, a profile picture, if the user wants to add one and it will offer the chance to edit this information whenever the user wants to. Underneath this information, there will be on display a list of favourite libraries that the user will have previously selected. This feature is going to be explained with more detail in the section "The profile of the library".

#### **5.2.4. Other features of the application**

##### ***Search***

In this section of the application the user will be able to search any library he/she knows by introducing its name in a search bar. When clicking the name of the library searched, the app will redirect him/her to the profile of the library so that he/she will have the capability to look up the library's occupancy and any other kind of information about that the app provides. In addition, the last searches that the user has done will remain visible under the search bar.

##### ***Favourites***

Every student has a routine of study, certain things they do during their study time, certain schedules and also certain places where they go to study more often. For this reason, having a list of her/his favourite libraries will be truly useful. With only two clicks, the first one on the favourites section and the second one in one of his/her favourite libraries, the user will be able to access the profile of the library.

The favourite sections will be very useful for the user. Clicking the corresponding button, a list of favourite libraries will be displayed. Libraries that the user will have previously selected as a favourite by clicking a heart shaped symbol mentioned in the profile of the library or by clicking the same heart available in a list of all the libraries. By clicking this heart again, the library will be removed from the list. At the top of the screen, there will be a plus symbol (+) and the writing: add to favourites. When clicking this button, the app will redirect the user to the list of all the libraries in Barcelona. There the user will be able to see every library available and add any library he/she wants to his/her list of favourites.

Furthermore, and as mentioned above, this list will also be displayed in the profile of each



user, as it is part of his/her information in the app. In his/her profile the user will have the capability to see the list and to eliminate a library from it by clicking again on the heart symbol.

### ***Configuration***

In this section of the application the user will be able to adjust the settings. This section will contain the following features:

- Account: the user will be able to modify his/her name and surname, email address, username and password
- Notifications: the user will be able to allow or not BibApp to send him/her notifications
- Location: the user will be able to allow or not BibApp to access his/her own location and display it on the map
- Search history: the user will be able to erase his/her previous searches
- Help centre: by clicking the corresponding button the user will be redirected to the web site of our application, where there will be any type of information about BibApp
- Log out: by clicking the corresponding button the user will end his session

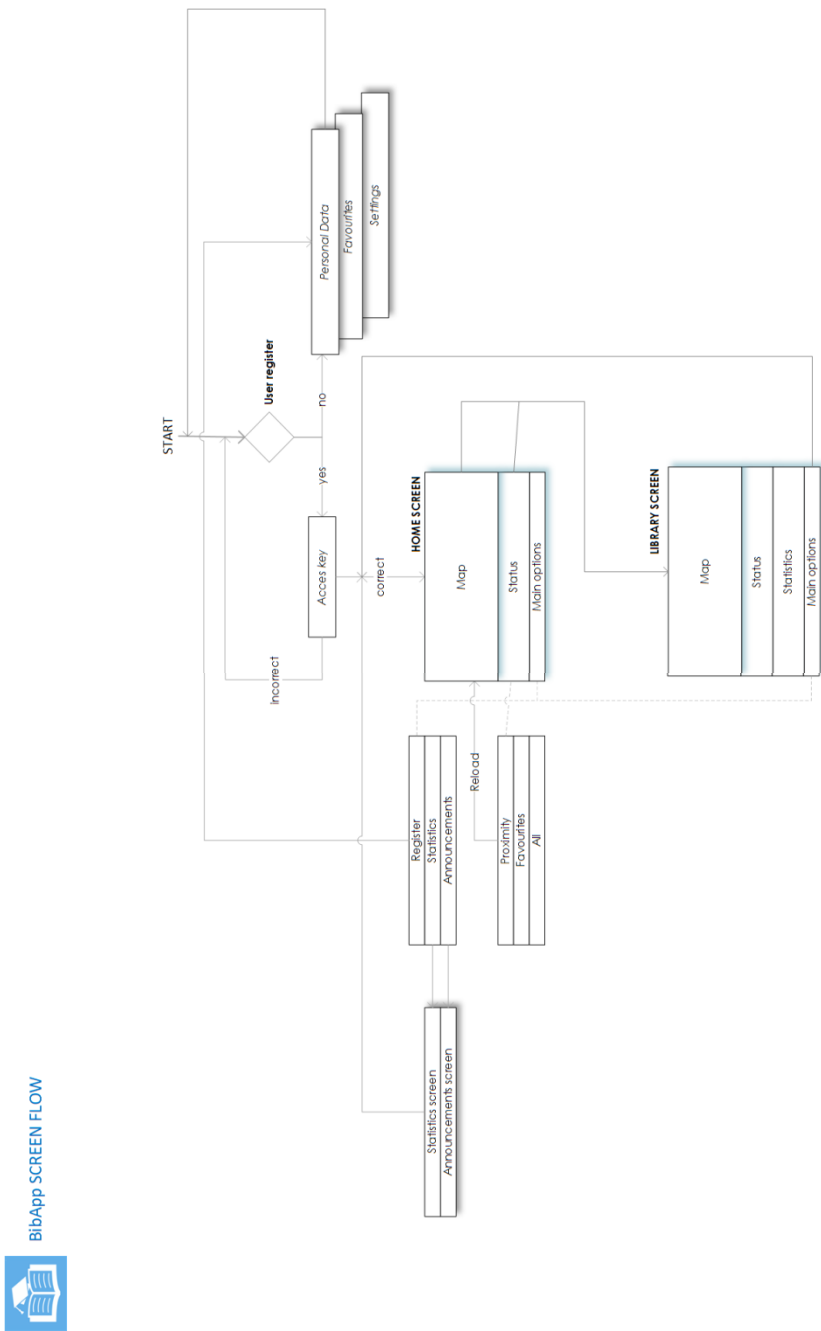


Image 11. BibApp's screen flow chart. Source: own elaboration



### 5.3. Design of the screens

The interface of an application is like the clothes one uses to go on the street. It is also the layer between the user and the functional heart of the app, the place where the interaction begins.

To a larger extent, it is compounded by buttons, graphics, icons and backgrounds, which have a visual appearance different for each operating system, because Android and iOS, for instance, have their own and particular way to understand the design.

While thinking about the design of BibApp, we have tried to accomplish two different things: an easy use app and an application different from the others.

In this section of the project it is going to be showed how the app has been designed.

#### ***The icon:***

To create the icon of the application we have considered the app as a product that is going to be in a shelf next to a lot of products and the icon is like its wrapping paper.

This icon will represent the application in the different app stores (next to its promotional texts and screens) as an element to convince the user to download it. As it is going to be explained in the project, our business will have its own logo and we have decided to use the logo in the app icon.



*Image 12. BibApp's icon. Source: own elaboration*

The next screen shows how the app will look in the background of an iPhone 6.



Image 13. Screenshot of an iPhone 6, showing the application icon. Source: own elaboration

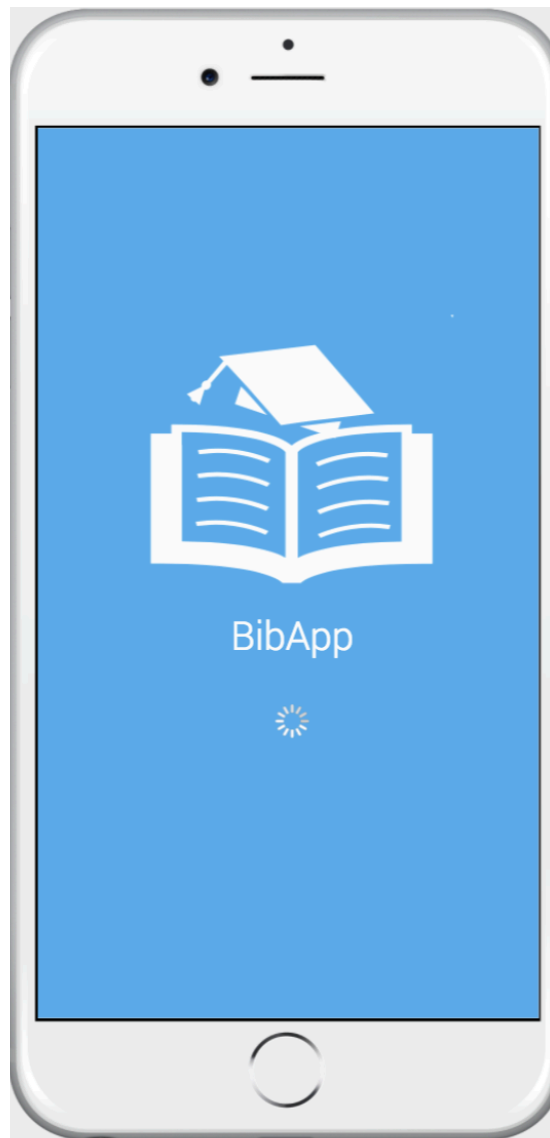
### ***The Initial screen:***

Also known as *splash*, the initial screen is the first screen the user is going to see when he initiates the app. This screen is shown briefly the first time the application is opened. It is used as a presentation of the content while the app is loading, that is the reason why you can see a loading spinner on it.





As it is going to be showed for a brief period of time, just a few seconds, we have limited the amount of information this screen shows:



*Image 14. BibApp's splash screen. Source: own elaboration*

- It shows the user the app logo while it loads. The logo symbolizes a library, with the figure of the book, and the students, with the figure of a graduation cap.
- It shows the name of the app.

Following a pattern of simplicity and confidence, the background is blue with white writing in it.

### **Welcome screen**



*Image 15. BibApp's welcome screen. Source: own elaboration*

Once the app has charged, it welcomes the user while still showing the logo and the name of the application. In this screen, the app gives the user two options. The first one is to create a new account and register in our databases. The second one comes after the following question: Already have an account? It offers the user the possibility to log in his/her own account.



**Login screen:**

Image 16. BibApp's log in screen. Source: own elaboration

The login process is really simple. As you can see in the screen above, the user only needs to fill two fields. One asking for his/her username or email address and the other asking for the password he/she chose while creating the account. Once this fields are complete and correct, the user only needs to click the button to login.

Underneath this button there is a question that says: Have you forgotten your password? By clicking in that question, the user will be redirected to a page in order to recover his/her

password.

**Register screen:**



Image 17. BibApp's register screen. Source: own elaboration

To create a new account, the user will have to fill in the mandatory fields showed in the screen and click the button to register. Beneath the button there is the writing: By registering you are accepting the terms and conditions of use and the privacy policy of BibApp.

In both, register and login screen, by clicking the button “Atrás” which means back, the user will be redirected to the welcome screen.



After the register, and as it is the first time the user has access to the app, it will ask him to allow the use of notifications and allow BibApp to access the user's location. The user will be able to modify these decisions in the app settings.

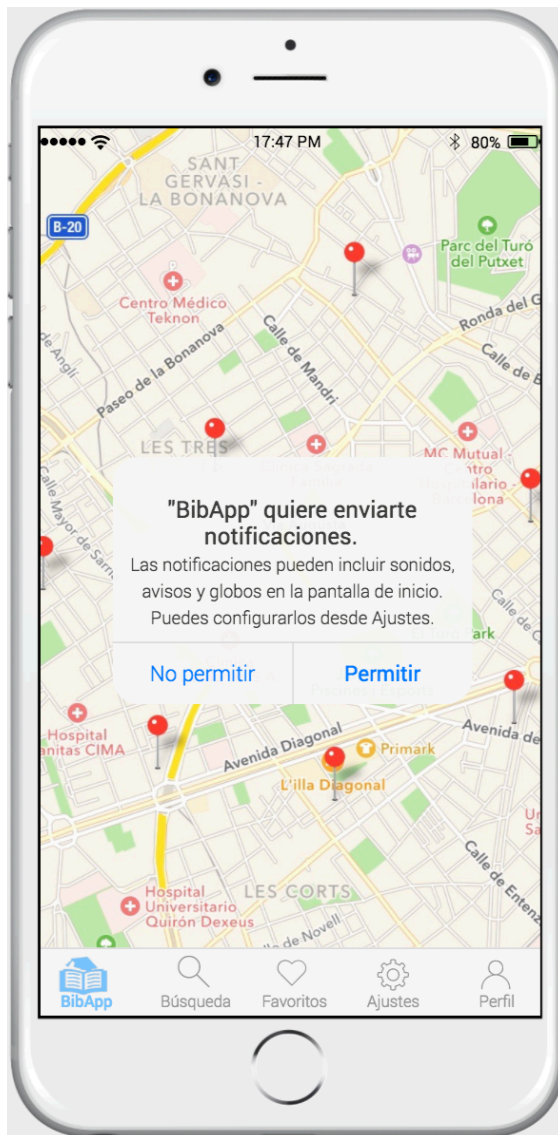


Image 18. BibApp's notification alert screen. Source: own elaboration

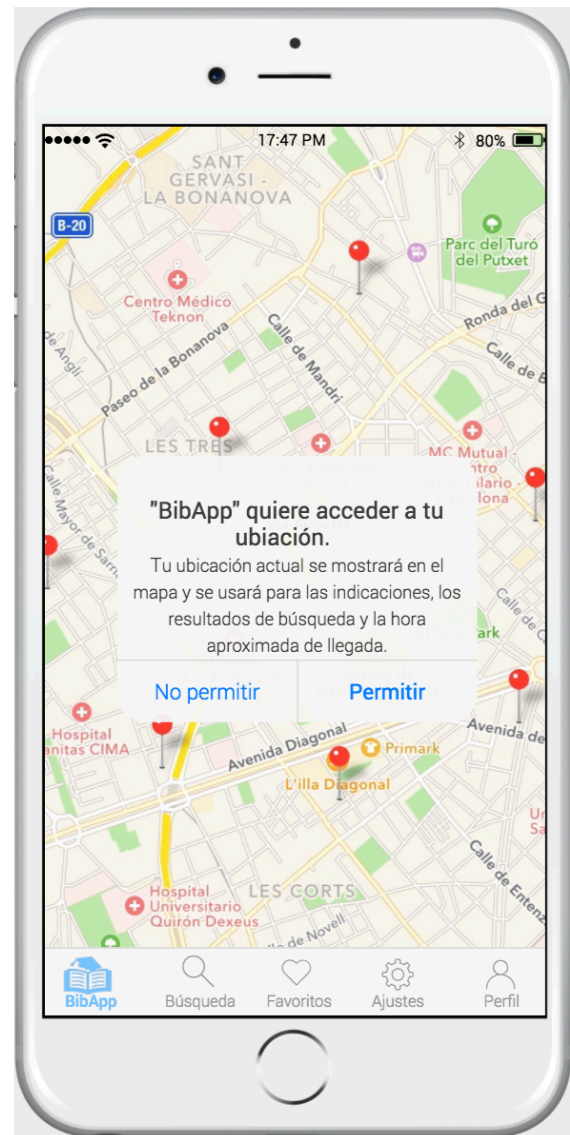


Image 19. BibApp's location alert screen. Source: own elaboration

**BibApp's main screen:**

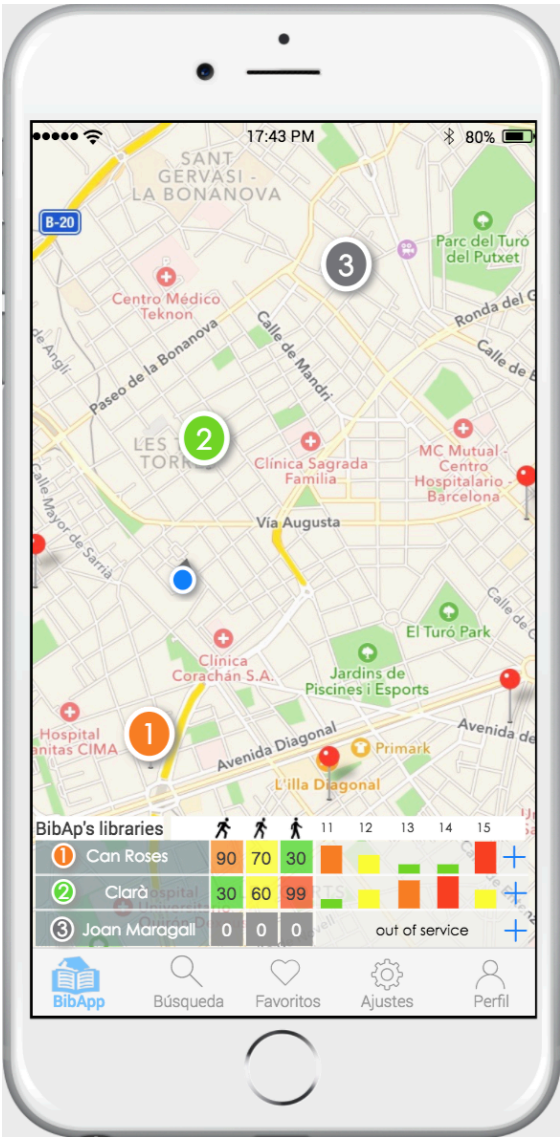


Image 20. BibApp's main screen. Source: own elaboration

The main screen is the heart of the application. Using the map as its background we give location a greater importance on the app. The screen shows the location of the user and libraries he/she has around. As mentioned above, by clicking any of the libraries pointers the user will be redirected to the profile of the library in question. Over the map and at the bottom of the screen there's the table that shows the status of the libraries.

Moreover, in this screen we see for the first time the menu of the app. It is a bottom menu,



with icons of every feature the app can provide to the user. The icon of the main screen is BibApp's icon.

***Profile of the library:***

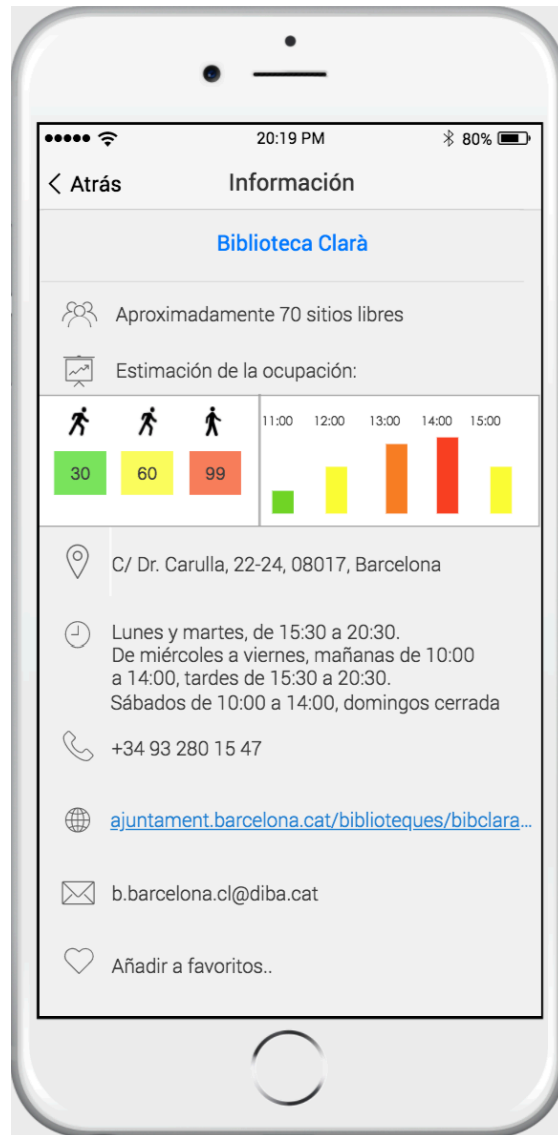
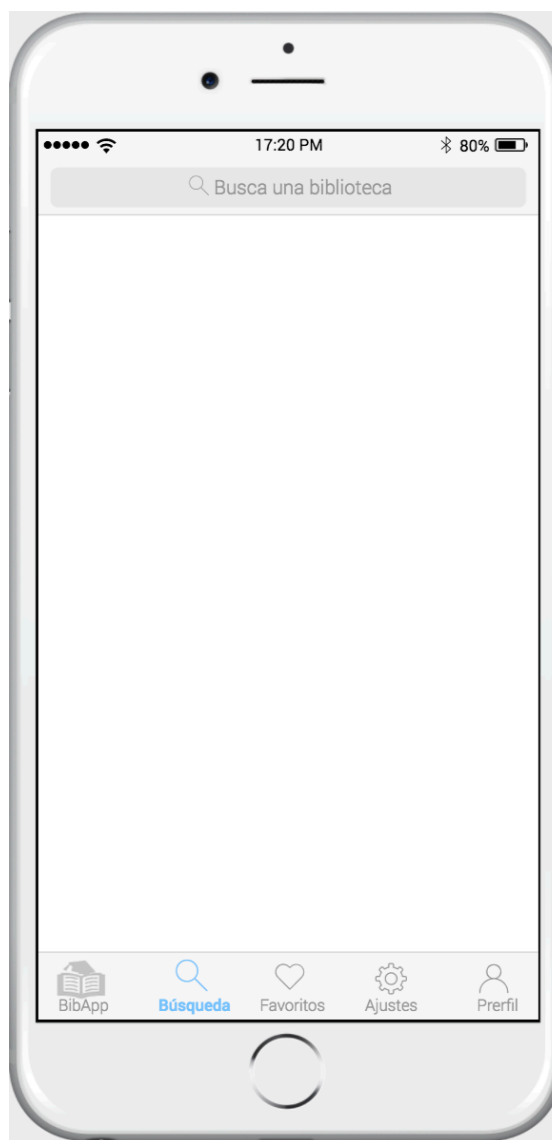


Image 21. Profile of a BibApp's library. Source: own elaboration

As mentioned above, when the user clicks on a map pointer of a library, searches a library or accesses to it by the list of favourites, he is redirected to the library's profile. This screen will provide the user with all the information about the library explained in the section *"The profile of the library"*.

By clicking the button that says “Atrás” the user will be redirected to the screen he/she came from.

**Search screen:**



*Image 22. BibApp's search screen. Source: own elaboration*

By clicking on the search bar, a keyboard will show up and the user will be able to search any library he/she wants.





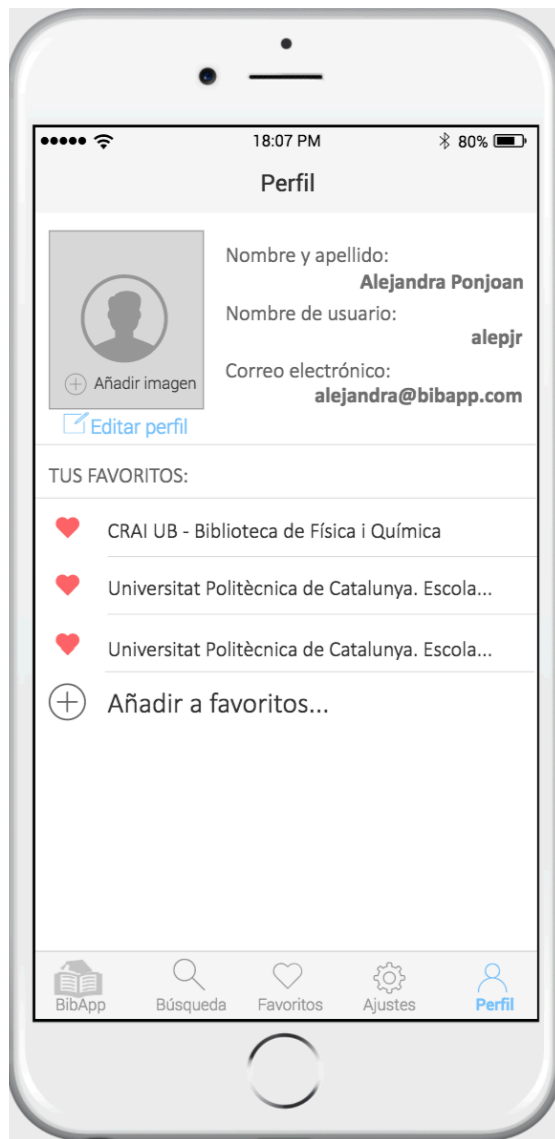
**Profile of the user:**

Image 23. Profile of a BibApp user. Source: own elaboration

This screen shows the user information about his/her account and connects with other features of the app. By clicking the blue button that says “editar perfil” the user is redirected to the account’s configuration screen where he/she can edit all his/her information. Underneath the list of favourite libraries there is the writing “añadir a favoritos” which means add to favourites. By clicking it, the user will be redirected to the list of libraries and will be able to choose or delete libraries from his/her list.

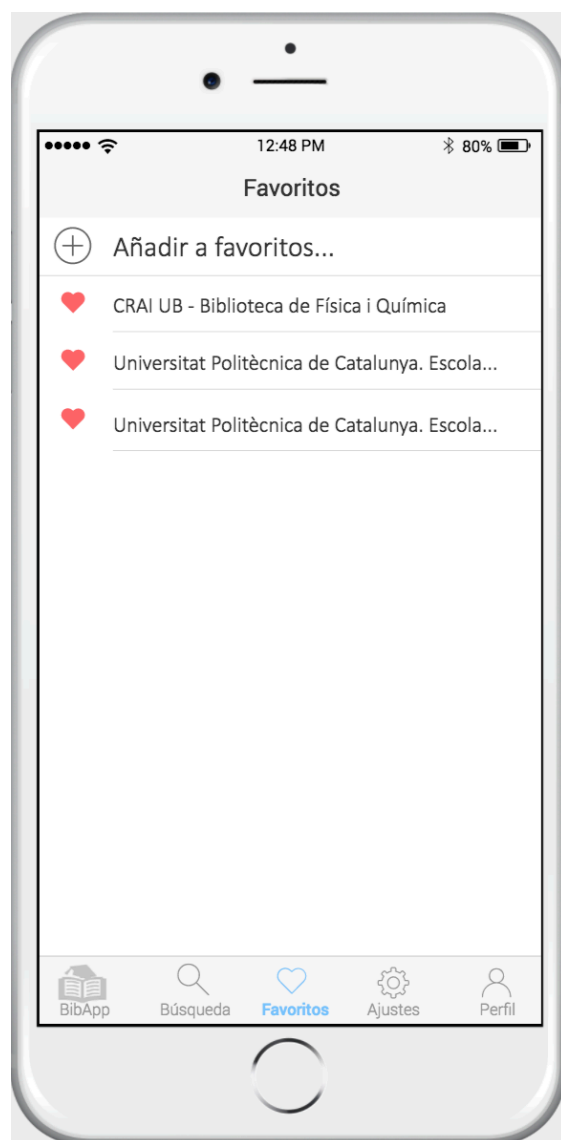
**Favourites:**

Image 24. BibApp's favourites screen. Source: own elaboration

This screen is really simple, it shows the same list mentioned in the profile of the user and by clicking the button add to favourites, the user is also redirected to the list of libraries.



**List of libraries:**

Image 25. BibApp's list of libraries. Source: own elaboration

The list of libraries shows the user all the possible libraries of his/her city. Once in the list and by clicking the heart shaped icon next to the name of the library, the user can add or delete a library from his/her favourites.

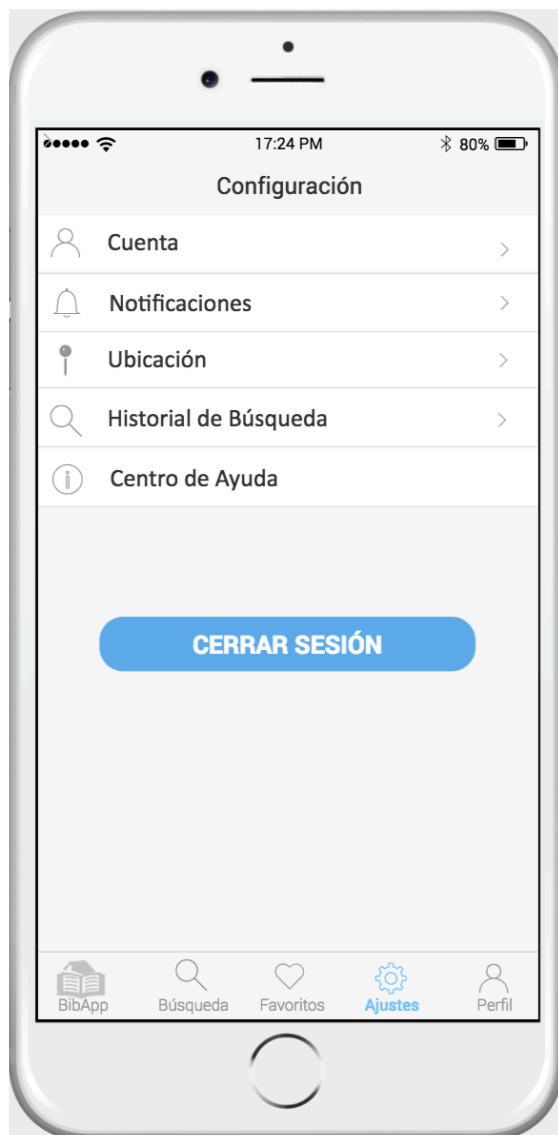
**Settings:**

Image 26. BibApp's configuration screen. Source: own elaboration



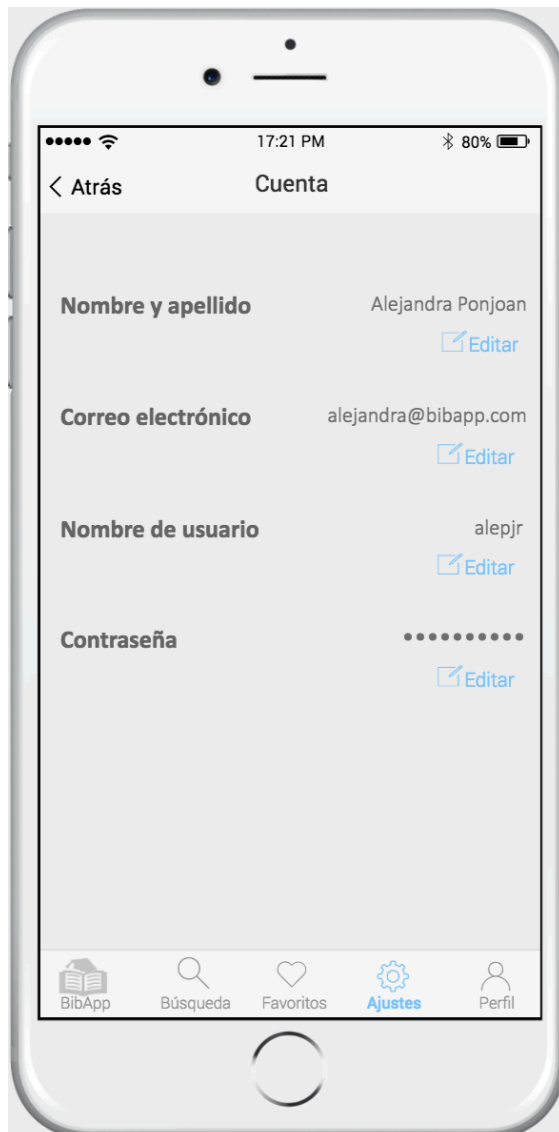


Image 27. BibApp's account configuration screen.



Image 28. BibApp's history of search configuration screen. Source: own elaboration

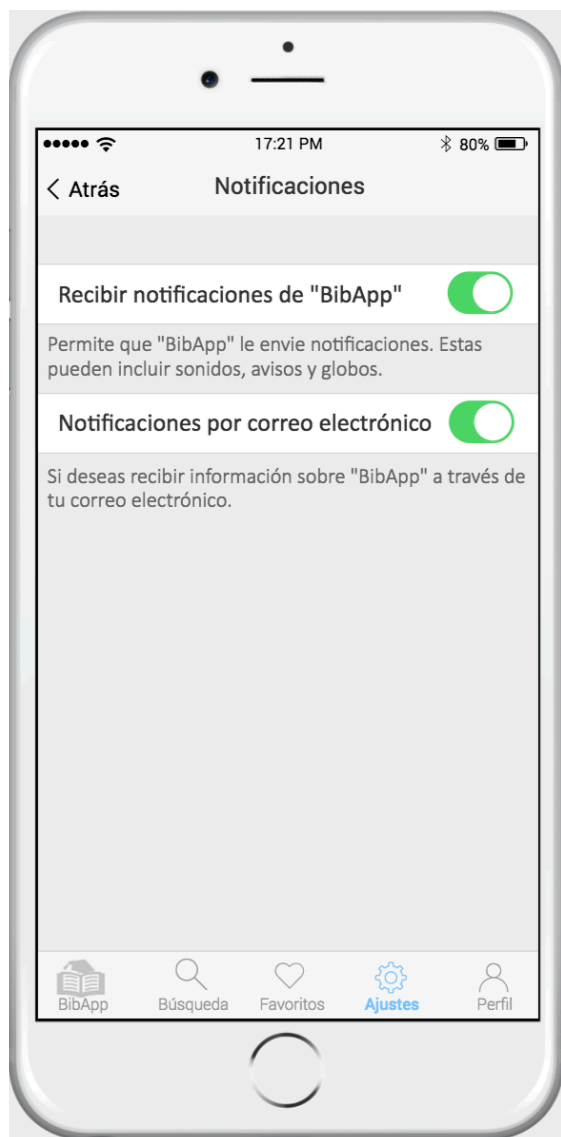


Image 29. BibApp's notifications configuration screen



Image 30. BibApp's location configuration screen. Source: own elaboration



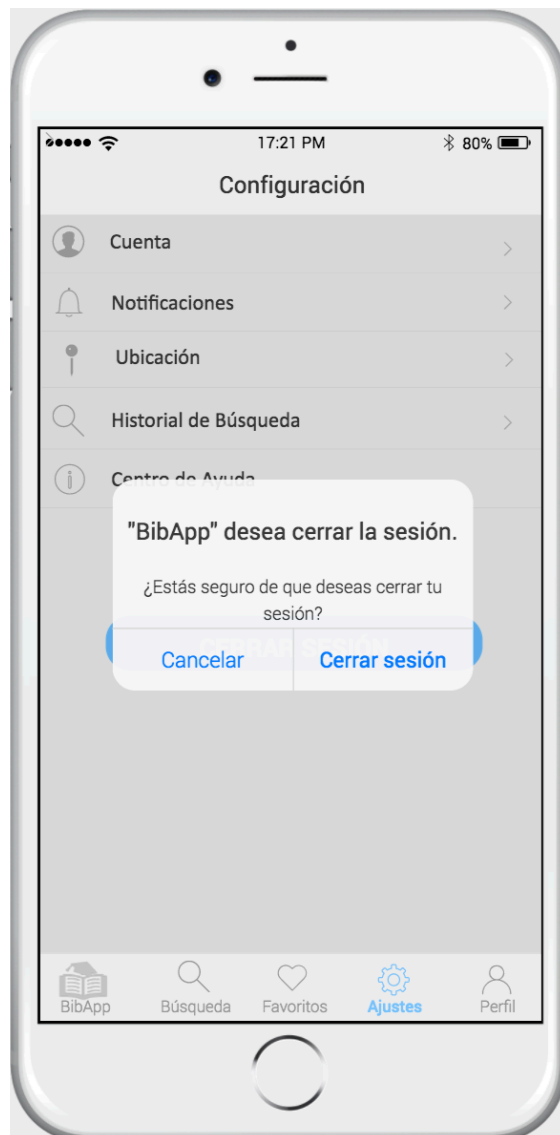
**Log out screen:**

Image 31. BibApp's log out screen. Source: own elaboration

## 5.4. Validation of the design

The design's validation of an app can be defined as the provision of data which sustains the existence or veracity that the requirements for a specific use have been fulfilled. The main objective of a validation process is to make sure that the customer's expectations are fully satisfied.

In order to validate the design of BibApp, we have taken into consideration two extremely important aspects of an application's design: its accessibility and its usability.

### 5.4.1. Accessibility

Potentially, anyone with a smartphone and Internet access can be a user of the type of applications that facilitate the access and use of information and communication technologies (ICT). Currently the majority of the users with mobile Internet download applications. Therefore, it is a duty of the responsible parties to guarantee the accessibility of these applications in equivalent conditions for all users.

When we talk about accessibility of mobile devices, it generally covers both the device and the applications; it is the combination of both that will result in the overall accessibility of the device. The presence of the touch screen generates different needs depending on the disability for the interaction with it and the available applications.

According to the definition provided by Apple "An application is accessible when all the elements of the user's interface with which users can interact are accessible. An element of the user's interface is accessible when it correctly indicates that it is an accessibility element". As we can see, this definition refers in particular to the elements of the user's interface and the information they offer, as well as their adjustment to the operating system of the platform on which they are run (smartphone or tablet). However, the accessibility of the app depends on more elements than the interface or its more or less "comfortable" fitting with the operating system, such as, the text-background colour contrast. In this case, we could say that "an application is accessible when any user, regardless of their functional diversity, can use it on their mobile device satisfactorily with their usual access system".

Accessibility is a characteristic that benefits all citizens, although it is usually the lack of it that





makes them aware of its importance. Hence, some population groups, such as people with disabilities, are the main disadvantaged by the lack of accessibility, particularly in the online medium and mobile devices. People with disabilities constitute a heterogeneous sector of the population, but all of them have in common that, to a greater or lesser extent, they need additional guarantees in order to live with full rights or to participate with the same conditions as any other citizen in the access of goods and services.

We have evaluated our application's accessibility taking into account the following criteria:

1. Navigation and orientation: with the analysis of this criterion it is intended to value the correct structure of the interface of an app, so it is more comfortable the navigation inside the application with a mobile device. It is divided in three sub criteria.
  - a) Coherent distribution: the different visual controls for the navigation between sections of the application must be logic, homogeneous and present an appropriate model of visualization for the platform used for the app. This model of distribution is defined by the position of the visual control and by its aggrupation with near controls. The non-compliance of this sub criterion affects either people with disability or without it.
  - b) Section titles: this sub criterion is violated if section titles do not describe the content of the interface or the screen. The failure of this sub criterion may affect any person, but especially blind people and the ones with cognitive impairment, because they will not be able to orientate themselves if the app uses many consecutive screens o have various functionality sections in the same screen. In addition, the will be unable to know in what step of a process they are if the title of the screen or section does not express it clearly.
  - c) Links and buttons identification: this sub criterion is violated if the content of the buttons, links or activating controls cannot be understood out of a context. Many blind users who use support products on their mobile devices use the jump function between links to navigate a web page or the interface of a native application faster to find information faster. This navigation method is also used on some mobile platforms to jump between headers, images, buttons or text boxes for screen reader users. For this reason, it is necessary that the

activating controls such as buttons and links have clear identifiers with full meaning out of context.

2. Forms: with this criterion the association of labels with the controls of the forms is valued, as well as the help that is offered to the user to complete them and on the possible errors that they may commit when doing so. We have divided it into two sub-criteria:
  - a) Labelling controls: evaluates whether there are form controls that lack a label, or if the label is not associated with the control correctly. This barrier mainly affects blind users who work with screen readers and users with cognitive disabilities. The association of controls with labels implies that these technical aids correctly identify the value that must be entered in each field, so if the fields of a form lack the correct labels or their association, these users will not know what value should enter in each field.
  - b) Information of errors and suggestions: it is not fulfilled if the mobile application does not adequately inform of the errors made when filling out a form, does not offer help to fill in fields that require specific formats or values or no suggestions are available to make the correction. When this situation occurs, users may not know how to fill in the form. This barrier affects all people.
3. Images: this criterion evaluates the existence of alternative texts in the images, as well as the degree of correction of said texts. The sub-criteria in which it is divided are the following:
  - a) Existence of alternatives: it is not fulfilled if the existing images in the interface of the mobile application are presented without a textual alternative indicated through the accessibility layer of the mobile platform. If the images lack an alternative text, the people who navigate with a screen reader will not be able to access the information offered by them.
  - b) Content of the alternatives: failure to comply with this sub-criterion occurs when the alternatives provided do not correspond to the functionality of the image (for example, decorative images with alternatives that interfere with access). The alternative texts provided in the images must correctly express their content.
4. Colour: this criterion evaluates three possible barriers: the contrast of the images, the contrast of the text with the background and the semantic use of the colour. The first two sub-criteria affect mainly people with visual impairment, and the last



one people with colour blindness or who do not correctly differentiate the colours, as well as those who have an intellectual disability.

- a) Contrast in images: it is evaluated that there are no images with texts or graphics with insufficient contrast between the foreground and the background.
  - b) Contrast of the text: the sub-criterion is violated if the colour of the text presents an insufficient contrast with respect to the colour of the background.
  - c) Use of colour: non-compliance occurs if information is transmitted using only colour as an indicator; for example, by means of warnings of obligatory fields in forms or legends in graphs. If there is no text alternative to this use, blind people who use a screen reader will not have access to this information and will also confuse those who see but have difficulty differentiating colours.
5. Organization of the interface: this criterion ensures that the user avoids displacements (use of scrolling) and can perceive the navigation options and the relevant content in the first sweep of the application (or at an initial glance), since it is important that the user gets an idea of the application after accessing it. As the screens of the devices are limited in size, the breach of this criterion forces the user to make a displacement on the interface to navigate, with the difficulty that this implies in the mobile device to some profiles. It may be the case of users who do not perceive the content or the navigation options on the screen (before making a trip) get confused and assume that content or those options are not in the application.
- a) Make sure that the important or most relevant content precedes the one that is not: the important or most relevant content should be located in such a way that it is visible without the need to move. Decorative images, advertising, etc. should be limited to a minimum.
  - b) Navigation on the screen: navigation options should be positioned on the screen so that it is visible without having to scroll. It is important for users who can recognize the navigation of the application once it is loaded without making any movement.

We will apply these criteria bearing in mind the following functions of the application:

- Logging in
- Searching a library
- See the occupancy of a library
- Searching other information of a library
- Add or delete a library from your list of favourites

With the criteria and the functions of the application we have sorted out a punctuation system to quantify the accessibility of BibApp. This system consists in giving every function of the application a punctuation between 1 to 5, being 5 the highest punctuation of accessibility. For every function of the app, we are going to evaluate every criterion explained above. To do so, we have asked some of our potential users to give their opinions. We have asked them to try to put themselves in the shoes of a person who may have a difficulty or a disability, such as a person with visual impairment, a blind or colour-blind person or someone who has cognitive impairment.

In the table below there are the results of this evaluation.

	Log in	Search a library	See the occupancy	Searching information	Add/delete from favourites
Navigation and orientation	5	5	4	5	3,5
Forms	5	5	5	5	4
Images	5	4	4,5	3,5	5
Colour	5	5	1,5	5	3
Organization of the interface	5	4,5	5	4	5
TOTAL	25	23,5	20	22,5	20,5

Table 3. Punctuation on the criteria for accessibility evaluation Source: own elaboration



As we can see in the table, out of 25 possible points for each function of the app, none of them has less than 20.

Although the overall for every function is positive, we can find three failures following the criteria. These are:

- In the search for information about a library while following the criterion of images. In the profile of each library there will be the name of it, its occupancy and other kind of information such as its opening hours or its exact address. This information will be placed in the screen next to an image representing the type of information that will be provided. This may cause a problem of understanding to a person with cognitive impairment or to a blind person, because the image is not followed by a description. However, by looking at the information next to that image, the problem is almost completely solved, because even though the user may not understand/be able to see the image, he/she will be able to understand the information provided next to it.
- If the user wants to see the occupancy, following the criterion of the colour. A colour-blind or a blind person will not be able to identify if the library is full or not with the traffic light system proposed. However, when accessing to the profile of the library the user wants to go to, he will be able to read or have read the amount of available seats in the library.
- If the user wants to add or delete a library from his/her list of favourites, following the criterion of the colour. In order to add or delete a library from the list, the user has to click a heart shaped icon that will be filled in red if the library is on the list of favourites, or that will be empty if the library is not on the list. This problem can be easily solved by adding an emergent text that says: “added on your list” or “not on your list” when the user clicks the heart shaped icon.

In conclusion, and after having done this evaluation, we have considered the level of accessibility of our application is the appropriate. Despite this, we are really aware of the fact that improvements can always be made. Hence, although for now, BibApp has the design shown in this project, it may not be the final one.

### 5.4.2. Usability

The usability in mobile applications is one of the fundamental elements for their success.

Users have become more familiar with touch gestures than with those done through elements such as keyboards or mouse.

However, not all applications have been able to reap the same success. Many are those that have fallen into oblivion for different reasons. One of these reasons is the difficulty in the usability of the app. Unintuitive gestures or poor organization of the elements in the design are usability flaws that can lead users to discard a certain mobile application and move on to find better alternatives.

The term usability, refers to the ease with which people can use a particular tool or any other object manufactured by humans in order to achieve a specific goal. Particularly, the usability of a software application refers to the agility with which users can use it to achieve a specific objective. The greater the degree of usability of an app, the more likely it is that it will remain installed on the mobile devices where it has been downloaded.

Through this definition of usability, we can see that it is an essential feature that an app must have.

Usability is related to the attributes of an application or system. In order to validate the usability of our application we have considered the following attributes:

- **Effectivity:** It is related to the precision and completeness with which users use the application to achieve specific objectives. The quality of the solution and the error rate are indicators of effectiveness.
- **Efficiency:** It is the relationship between effectiveness and the effort or resources used to achieve this. Efficiency indicators include the completion time of tasks and learning time. The less effort or resources, the more efficient.
- **Satisfaction:** It is the degree in which the user feels satisfied, with positive attitudes, when using the application to achieve specific objectives.
- **Ease to learn:** The ease with which users reach specific objectives the first time they use the application. The first experience that users have with a new



system is to learn how to use it, and the user has to be able to rapidly begin working with the system.

- Ease to memorize: The ease to memorize the way to use the application and reach specific objectives. It also refers to the ease to remember how to use the application after having been a long time without doing so.
- Content: aspects related to the distribution of content and formats used to show information to the user.

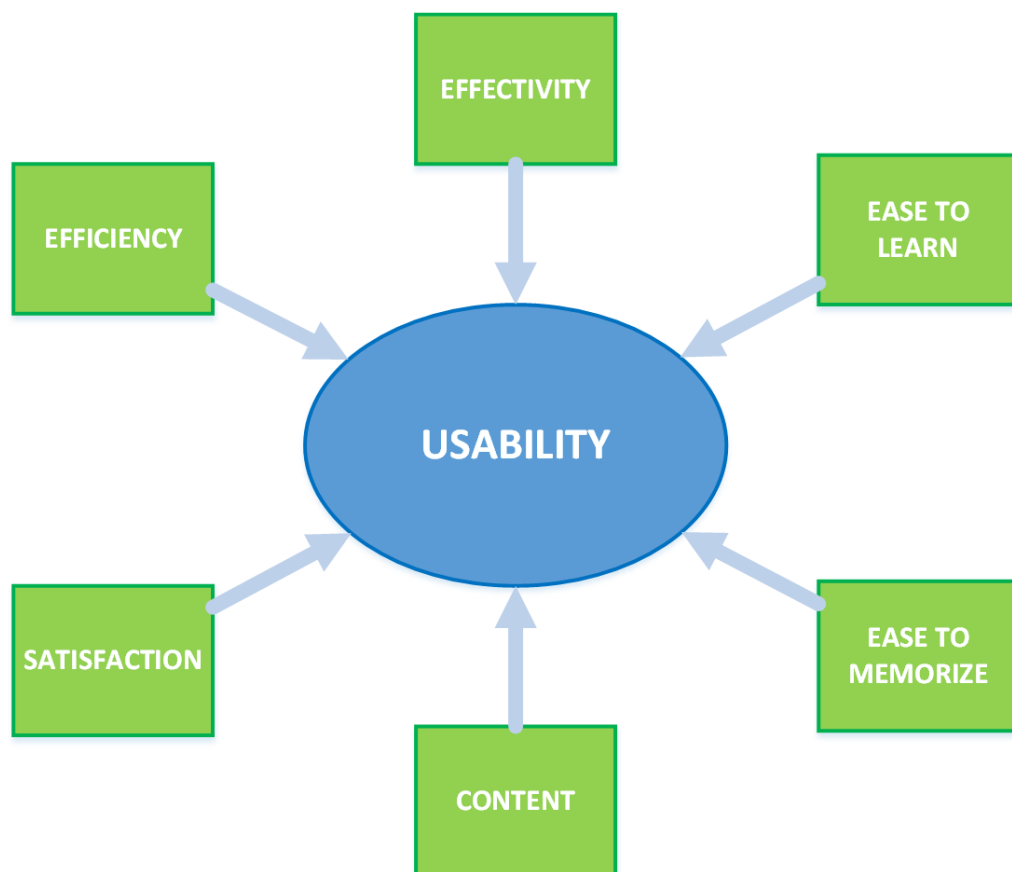


Image 32. Usability attributes. Source: own elaboration

Following the definitions of these attributes and by asking potential users of BibApp about them in our application we have reached to this conclusion:

- In terms of effectivity and efficiency, BibApp has been considered to achieve its main purpose, showing its users the occupancy of the libraries in Barcelona, with no trouble. With a map with all the libraries displayed on it, a list of all the libraries and a profile of each library giving all kinds of information about them, our potential users agree that the effort they will have to do to find what they want is really small, and the time spent on it is correct.
- The same has happened with satisfaction. Users consider the design of BibApp really comfortable and understandable, given the way it provides the information it was originally created for and also with all the other features it offers.
- As for the ease to learn and memorize, we have been told that with the map, the searching bar, the favourites section and the profile of each library and the user, the application is really easy to follow. It shows no difficulty in the way of using it, and every step is very clear.
- Last but not least, the content of the app. Everything in our application is headed to give information about the libraries. The other features the app provides are only to help the user and to make his/her experience with BibApp better.

For all the reasons mentioned above, we consider to have reached the level of usability required for an app. We think with our design the user will want the app to remain installed on his/her mobile device and will be satisfied with the services it provides.

## 5.5. BibApp premium

After having reflected in the design the ideas we had about how we wanted the application to offer our service, we have thought about some other features BibApp could offer. For this reason, we have decided to have a premium version of the application.





This version will have the following extras:

- The possibility to create a group with your friends.

Almost every student, although there are people who prefer to study alone, have a group of two or three friends with whom they meet to study. For this reason, a group with your friends in the application would make the process of meeting much easier. The group would count with a chat to send messages and arrange their meetings.

In a group of people, especially students, each person has its own schedules and ways in which he/she studies better: there is always the one who starts really early in the morning, the one that is always late, the pair that has to start exactly at the same time, etc. By letting the app having access to his/her location, the user will be able to share his/her own localization all the time with only the group of users he/she wants. This way, the group of friends will be able to know in what library is his/her friend studying without even talking to him/her, check the availability of seats in that particular library and decide whether to go or not, without interrupting his/her mate.

- The possibility to share the information of the libraries.

With the premium app, the user will be able to share with his/her friends the status of any library. This feature combined with the creation of the chat and the group will allow students to decide whether or not to study together or in which library they should do it.

The users who want to take advantage of this features will have to download the app and pay a small amount of money to fully enjoy all the possibilities BibApp can offer. Further information about the price and benefits we could obtain with this version of the app are explained in the next sections of the project.



## 6. Market Study

Smartphones have brought out a massive change in the lives of people. People enjoy great comfort with the advancement in science and technology. People in the present day find things much easier and perceive things based on technology. Smartphones play a vital role in this regard offering users a great platform for communication and access to a wide range of applications.

Human beings face tough challenges to lead life in this contemporary world. And, technology has become the deciding factor for people's standards. Life becomes updated and flexible with facilities to get connected to people and resources at any time. The mode of communication is open through several ways allowing people to enjoy and make best use of advancements. Also, people get better exposure to social life when they use smartphones with many different applications and accessories.

Smartphone has created new dimensions for business. It is not only the Smartphone vendors enjoying the business but it also created a new domain for mobile application developing companies, Internet services provider and other sectors of life to utilize the Smartphone to gain competitive advantages.

The latest surveys show that the popularity of Smartphone is increasing in general public with much higher pace than it is increasing in any corporate sector.

Apps are the presentation cards for enterprises in the digital era. It is a business that it is forecast to move 139 billion dollars in 2021.

Smartphone users spend an average of two hours per day using applications.

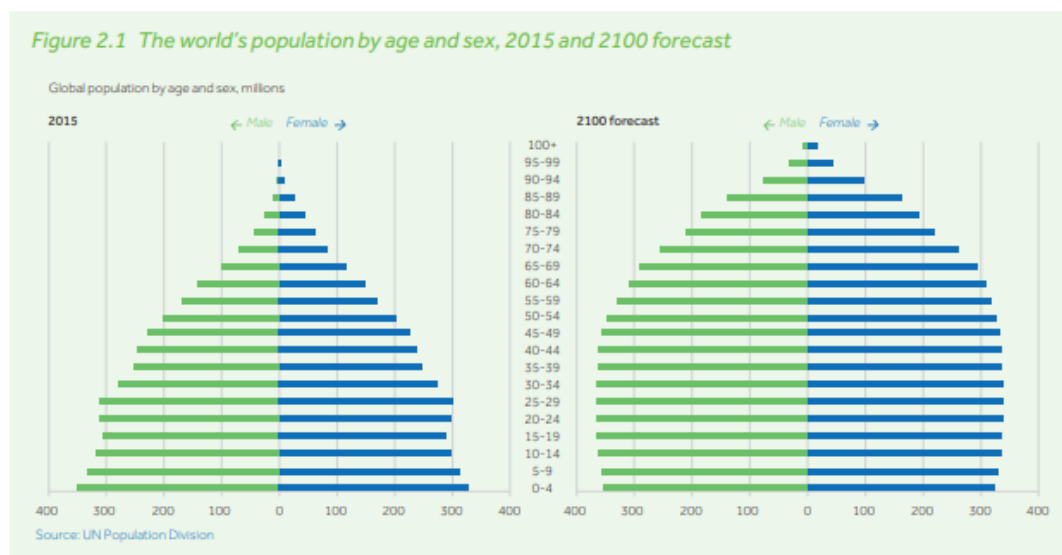
Since 2008 when Apple started this business with Apple Store, an authentic economy of apps has been created.

The main target of this project is the youth, which are normally the age range that more goes to libraries to study.

There are 1.8 billion people between the ages of 15 and 29 years old. The world is home to more young people today than ever before. Young people make up approximately one-quarter of humanity.

It is decided to focus on one specific range of age because it has been studied that apps that try to reach the whole population usually fail due to the fact that it is almost impossible to satisfy all people demands.

It is believed that young people is the more reachable market because this part of the population is the most confident when it comes to smartphones. This generation is the most open minded and the ones most interested and willing to download new apps that will offer them a service, in this case, avoid them making unnecessary commutes to a library when the library they intend to go is already full.



Graphic 10. The world's population by age and sex. Source: IndexMundi

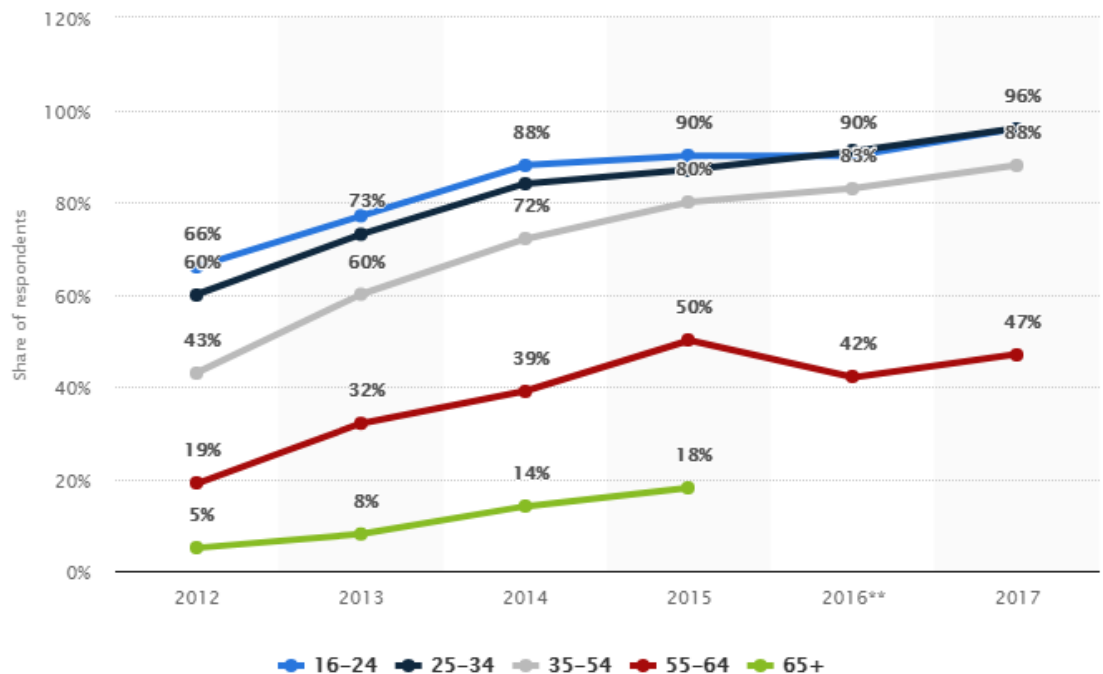
According to a new study from Pew Research Center 24% of teens go online “almost constantly,” facilitated by the widespread availability of smartphones.

African-American teens are the most likely of any group of teens to have a smartphone, with 85% having access to one, compared with 71% of both white and Hispanic teens. These phones and other mobile devices have become a primary driver of teen internet use: Fully 91% of teens go online from mobile devices at least occasionally. Among these “mobile teens,” 94% go online daily or more often. By comparison, teens that do not access the internet via mobile devices tend to go online



less frequently. Some 68% go online at least daily.

In 2017, 96 percent of respondents aged between 16 and 24 reported owning a smartphone:



Graphic 11. Percentage of people that owns an Smartphone. Source: Statista

## 6.1. Spanish market

In 2012, just 41% of Spanish population owned a Smartphone. Five years later the report 'Google Consumer Barometer Report' carried out by Mountain View Company with the collaboration of Kantar TNS, has determine that the value of 41% has been doubled. This represents a huge increase of the use of these devices in a very short period of time. According to the report submitted during the Mobile World Congress in Barcelona, the key for these changes in the society habits are related with the communication media and daily life, such as social networks. These have been fundamental for achieving this number of people that uses smartphones.

Focusing on young people which are the main target of this project, 93% of people

under the age of 25 use a search engine in their mobile phone.

In Spain there are 7.11 millions of young people between the ages of 15 and 29 years old. This represents the 15.3% of the population, 46 millions of citizens.

At the present time, there is a huge concern about the big amount of young people that dropout their studies. The early school leaving it is considered to be when one person drops their studies without completing anything further than compulsory secondary education.

For the first time Spain's student drop-out rate has fallen below 19%, an all-time record. In 2008, in fact, the rate was 31.7%. The current percentage actually represents a decrease in the number of young between the ages of 18 and 24 who have neither a diploma or are engaged in some type of training programs.

		Young people who work <b>29.1 %</b>	Young people who do not work <b>70.9 %</b>
Young people who study <b>63,5 %</b>	without educational level distinction	<b>9.6%</b>	<b>53.8%</b>
	School dropout rate: <b>18.3%</b>	<b>8,20%</b>	<b>10.1%</b>
Young people who not study <b>36.5%</b>	With post-compulsory studies: <b>18.2%</b>	<b>11.2%</b>	<b>7.0%</b>

Table 4. Percentage of activities of young people.

Therefore, according to OCDE, if in Spain there is a total of 7.11 millions of young people, the approximate number of people that BibApp is addressed is estimated below:

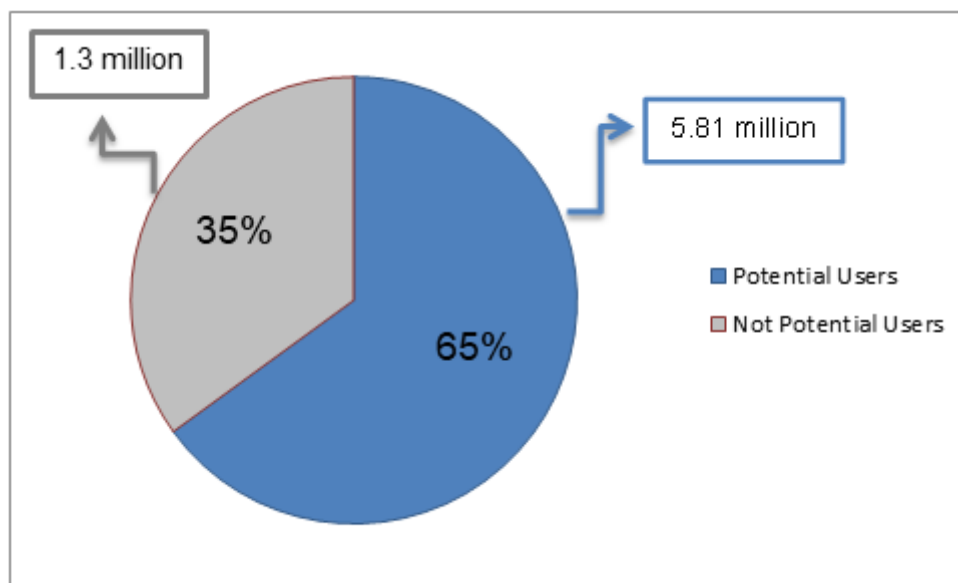
$$7.11 \text{ million} * 0.183 = 1.3 \text{ million students that dropout thier studies}$$

$$7.11 \text{ million} * 0.817 = 5.81 \text{ million young people that finish their studies}$$



Category	Number of people	Percentage
Youth with high school degree or a formative cycle of average degree	1.29 million	18.2%
Youth with university degree or higher lever training	4.51 million	63.5%
<b>TOTAL</b>	<b>5.8 million</b>	<b>81.7%</b>

Table 5. Estimation of people to whom BibApp is addressed. Source: own elaboration



Graphic 12. Spanish Potential users. Source: own elaboration

Although Spain has made some progress in improving its school dropout rate in recent years, nearly one in four young Spaniards are still dropping out of school early. It is known that Spain dropouts' rate, despite the reduction of the past few years, it is located in one of the highest of the European Union. So the numbers might be slightly higher in other countries. This has to be taken into consideration when expanding our business to other countries, especially in Europe.

For the second face of our expansion France, Portugal and Germany are studied:

## 6.2. French market

In 2018, the population in France is estimated to be around 65.23 million.

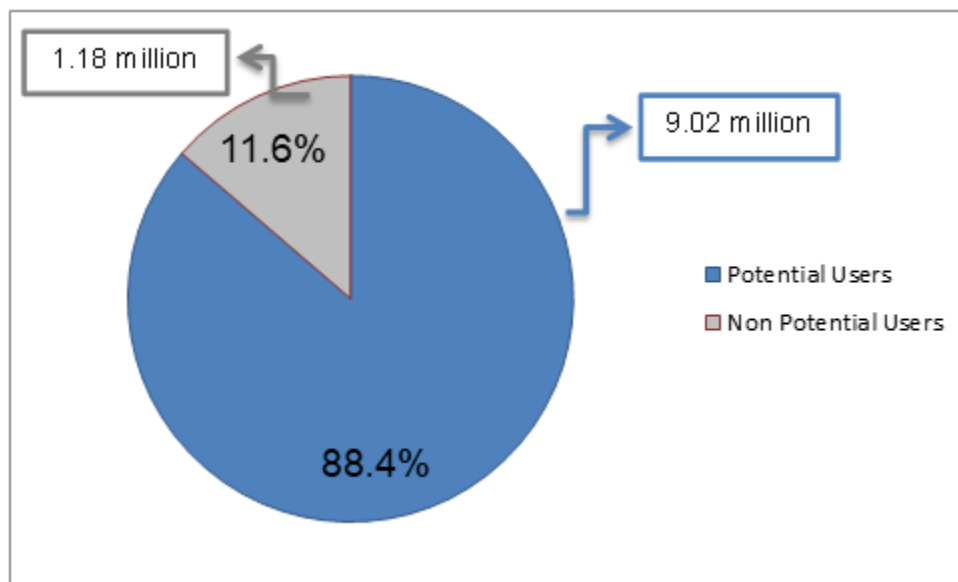
The approximate number of people between the age of 16 and 28 years old is a total of

10.200.000 people.

According to a European study (ec.europa.eu) 11.6% of young French people are school dropouts. Every year in France 110,000 teenagers leave school with no qualifications – so nearly 1.000.000 youngsters aged 18-28 have left the education system with no “baccalauréat” or vocational certificate, and not much chance of finding a job.

$$10.200.000 * 0.116 = 1.183.200 \text{ students that dropout thier studies}$$

$$10.200.000 * 0.884 = 9.016.800 \text{ young people that finish their studies}$$



Graphic 13. French Potential users. Source: own elaboration

### 6.3. Portuguese market

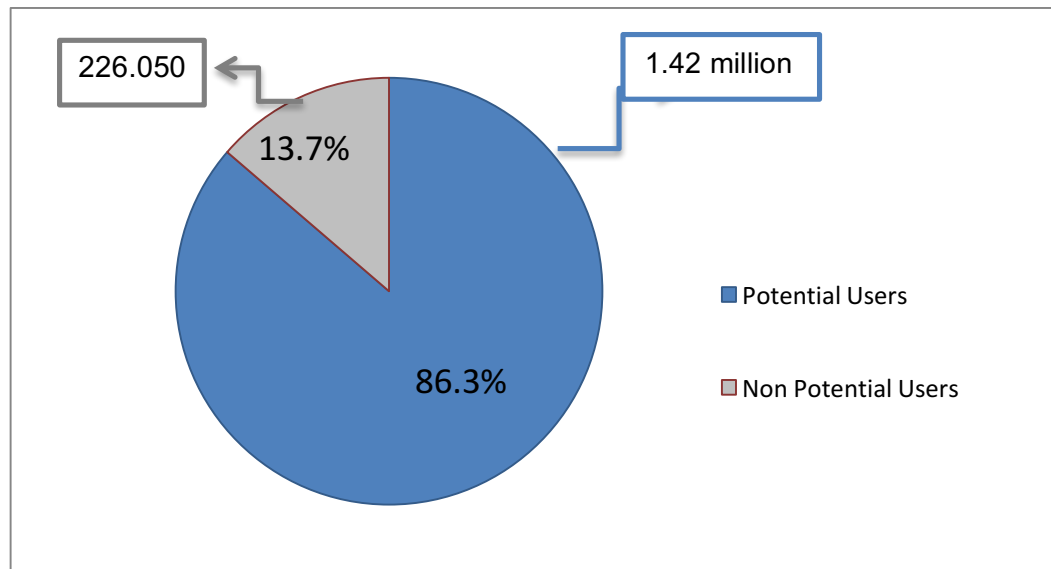
The current population of Portugal is approximately 10.296.000 citizens. Of the total of citizens there is approach a total of 1.65 millions of people between the ages of 15 to 28 years old. From this total of young people, 13.7 % are early leavers from education and training (age 18-24).

$$1.650.000 * 0.137 = 226.050 \text{ students that dropout thier studies}$$





$$1.650.000 * 0.863 = 1.423.950 \text{ young people that finish their studies}$$



Graphic 14. Portuguese Potential users. Source: own elaboration

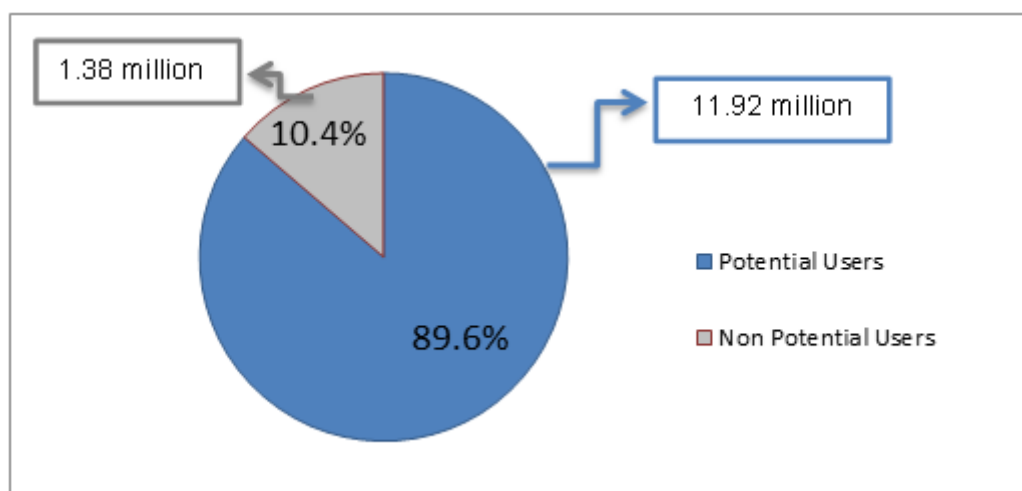
## 6.4. German market

The population in Germany in 2018 is 82.271.680. The approximate number of people aged between 15 and 29 years old is 13.3 million.

Germany has one of the highest levels of upper secondary attainment: 86% of the country's 25-64 year-olds have obtained at least an upper secondary qualification (compared to the OECD average of 75%) The proportion of so-called early school leavers in Germany is approximately at 10.4%.

$$13.300.000 * 0.104 = 1.383.200 \text{ students that dropout thier studies}$$

$$13.300.000 * 0.896 = 11.916.800 \text{ young people that finish their studies}$$



Graphic 15. German Potential users. Source: own elaboration

BibApp is mainly directed to students that go to libraries for studying, but this is not the only market that BibApp will have. There are a lot of people that goes to libraries not for studying but for borrowing print books, get help from librarians, doing research, search online etc. With the new interne era, the number of people that goes to libraries for these last purposes have been lately reduced, but there is still a considerable number of people, especially adults, that like to go to libraries for reading books, the newspaper or for searching information due to the fact that they prefer paper books instead of internet.





## 7. Business description

The service that BibApp is going to offer is addressed for all type of students, it does not matter what they are studying, how old are they, etc. This service is directed for all students that want to go to libraries for studying. It is a fact that a lot of students go to libraries for studying, for this reason, almost every library has an enlargement in opening hours during exams periods. Our business is to inform users of libraries occupancy with real time data.

It is a very new and growing market, many retail business and shopping malls, etc. uses the technology that BibApp is going to use but not for the same purpose. There are similar apps in the United States of America but those are only address for students in one university campus, there is not threatening competition for the moment.

It has been decided to create a business that is a limited partnership. Limited partnership is the most common trading company in Spain. It is normally used by small self-employed entrepreneurs that with this method limit their responsibility through capital provided, avoiding to respond with their own personal equity to face their business debts. There is a minimum of one shareholder but there is no upper level. The shareholders can be working shareholders or capitalistic partners. The name of the company must be a name that no one before has ever registered. The minimum legal social capital is 3.000€ without existing any maximum limit.

The advantages of forming a limited partnership are:

- Limited responsibility to creditors, to social capital and the assets in name of the company
- Simplicity relative to bureaucratic procedures in the event of constitution and operation
- Minimal social capital request relatively low
- The minimum number of shareholders possible, 1
- Constitution cost affordable
- At a certain level of profit, taxes are lower in comparison with stock corporation



## 7.1. Launching de App

It is decided to set up a limited company where on one side are the partners that take part in the project and on the other, the investors. The minimum capital required for the legal structure of a limited company is 3.000€.

It is decided that the founding shareholders of the project hold the 66.6% of the company's capital, leaving to the investor the remaining 33.3%.

There are two different possibilities to get funding:

- 1) Capital contribution of the partners for the minimum capital. The rest of the required funds will be provided by the investor. A partnership contract will be signed with ancillary obligations that consist on cash disbursement until reaching the capital needed for the initial investment.

The distribution of the company shares can be:

- Partner number 1 (Natalia) – 1.000€ (33.3%)
- Partner number 2 (Alejandra) – 1.000€ (33.3%)
- Partner number 3 (Investor) – 1.000€ + Ancillary obligation that takes the form of cash disbursement for getting the desired funding through partners agreement. (33.3%)

- 2) The founding shareholders provide the minimum capital. Subsequently, the investor subscribes the capital increase with the necessary share premium.

At time X:

Partner number 1 (Natalia) – 1.500€ (50%)

Partner number 2 (Alejandra) – 1.500€ (50%)

At time X+1:

Increase in capital with a share premium.

Investor 1.500€ (33%) with a share premium of 200.000€

The final distribution of the share capital is:

Partner number 1 (Natalia) – 1.500€ (33.3%)

Partner number 2 (Alejandra) – 1.500€ (33.3%)

Partner number 3 (Investor) – 1.500€ (33.3%)

It is decided to choose option number 1 because is more advantageous. Disburse the money as it is needed according to the shareholder's agreement. The second option allows to have the funds immediately but it is a significant out-of-pocket cost for the investor.

As it has already been said, the vast majority of the funding will be obtained through a business angel, a person, business or group that provides financial backing for small startups and entrepreneurs. By means of a developed app, angel investors that are independent individuals, invest in companies that have a concept or an idea. Normally, business angels (or wealthy investors) use their personal disposable finance and business or professional experience to invest in the growth of a small business, generally in start-up or early stage. The influx of capital can help an idea develop into a viable company and provide the base to begin producing the product or service proposed. The capital they provide can be a one-time injection of seed money or ongoing support to carry the company through difficult times. A business angel investor can make investments on their own or as a part of a syndicate. Angel investors invest in early stage or start-up companies in exchange for an equity ownership interest. Sometimes this private investor not only provides money, but also generally is interested in becoming involved in the project by acting as a guide or mentor and a few times, angel investors are found among entrepreneur's family and friends.

Angel investors give more favorable terms than other lenders, as they are usually investing in the person rather than the viability of the business. They are focused on helping the business succeed, rather than reaping a huge profit from their investment.





An excellent solution for a new company to become bigger and to gain ground quickly is through business angels. The investment may have a huge impact of the business thanks to the monetary contributions and guidance of an angel investor. These individuals provide a bridge to success for small businesses that just have an idea and a real business that makes money and begins to grow. Once this is achieved, the business receive funds from a venture capitalist.

In the case that it is not possible to close a funding round with no private investor, a general meeting of partners will be convened for determining new funding source. This new source could be crowdfunding

#### WHAT IS CROWDFUNDING

Crowdfunding is by definition, “the practice of funding a project or venture by raising many small amounts of money from a large number of people, typically via the Internet.” This is commonly done through crowdfunding websites. Generally, entrepreneurs post their business idea as a campaign idea onto the website, with a description of the project. If people want to support the campaign, they can donate money to help self-starters achieve their goal. Sometimes, it is needed to set a monetary goal on the website and a time frame to reach the goal.

Traditionally, financing a business implied having a few or even a single donator for the whole needed amount of money. Crowdfunding, instead ask for thousands of potential funders for small quantities of money through internet.

Entrepreneurs are available to find different amounts of money from different investors through numerous crowdfunding online pages. The aim of these platforms is the same in all different options that exist, collect the needed money and show to all visitors how much funding has been yet obtained and how much more money is still needed.



Below is a brief description of each of the different type of crowdfunding:

- Donation / Reward Crowdfunding

People invest simply because they believe in the cause. Rewards can be offered (often called reward crowdfunding), such as acknowledgements on an album cover, tickets to an event, regular news updates, free gifts and so on. Returns are considered intangible. Donors have a social or personal motivation for putting their money in and expect nothing back, except perhaps to feel good about helping the project. People can donate money in small increments to a project they believe has moral, ethical value and that it is good for the community.

- Debt Crowdfunding

Investors receive their money back with interest. Also called Peer-to-Peer (P2P) lending, it allows for the lending of money while bypassing traditional banks. Returns are financial, but investors also have the benefit of having contributed to the success of an idea they believe in. In the case of microfinance, where very small sums of money are lent to the very poor, most often in developing





countries, no interest is paid on the loan and the lender is rewarded by doing social good.

- **Equity Crowdfunding**

Money is exchanged for shares. It allows large numbers of people to investing small amounts, funding early startups in exchange for equity, with the expectation to receive dividends or investment appreciation based on profits of the business.

## 7.2. Vision, Mission and Values

- Vision: Our business vision is to be a lucrative business, stable, and what it is tried to achieve with the creation of this app, is to provide a service for students. Frequently, students do not find a place to study during exams periods, because the libraries people normally go to, are full. BibApp is designed to avoid unnecessary commutes and to inform students about other available libraries that they might do not know that they even exist.  
Moreover, in a society where apps are becoming more and more used, this app provides a quick and simple alternative for finding the proper place to study.
- Mission: To achieve the goals of our business; a mobile app is going to be created. The app is addressed to people between the age of 16 and 28 years old that normally study in libraries. Of course, other ranges of people also use libraries so the target is much bigger but the app will be started with students. At first, BibApp will only operate in Barcelona, but the intention is to grow as fast as possible and implement the service to other countries, especially, Europe. It is believed that the key to expand our business is to offer an easy to used and reliable service.
- Values: Values are understood to be one of the foundations of successful companies. Below are defined the core values that has been identified essentials for the business establishment.
  - **Integrity**: In the business atmosphere where it is impossible to achieve goals without cooperating and taking part with others, it is believed that integrity is a basic value that all business should have. For clarifying what

we understand by integrity is: always act with honesty and transparency, fulfill our promises and engagements and treat employees with equity and respect.

- **Improvement:** Working constantly in order to improve our service and adapt to technological changes. Analytics are going to be examined to determine how people use BibApp and what features are most valuable to users.
- **Reliability:** Reliability is one of the keys to compete in the complex world that we are living in. Winning prestige requires a lot of time and effort, but it is enough with a few bad actions to gain a bad reputation. It is believed that if the market we address to recognizes us as reliable company and our compromises are fulfilled, a particular market share is going to be assured.
- **Teamwork:** working as a team is when great successes are achieved. Thus, it is very important to identify which are the strengths and weaknesses of each employee, in order to each of them perform specific tasks according to their abilities. Another thing to consider is to achieve a good working atmosphere and good relations between employees. Teamwork is better because it increases effectiveness, increases motivation, it simulates creativity, etc.
- **Quality:** Quality products help to maintain customer satisfaction and loyalty. Our customers expect us to deliver a quality service. If we do not, they will quickly look for alternatives. Quality products make an important contribution to long-term revenue and profitability. Quality influences BibApp's reputation and a strong reputation for quality can be an important differentiator in markets that are very competitive. For achieving this value, we are going to pay attention to all details, in order to create an efficient app.
- **Simplicity:** BibApp tries to offer a service for students. One of the goals is to create a very easy to use app for helping young people. Even when we address other public, simplicity is something very important.



The users experience must be efficient and rewarding; this is achieved with two pillars: effectiveness and simplicity.

- **Flexibility:** In today's competitive environment of technology it is very important to accommodate to all users, providing a service the most personalized as possible. Gone are the days where it was possible to create business and marketing plans a year ahead of time and expect them to be etched in stone. Movement is key, and responsiveness drives movement.

### 7.3. SWOT Analysis

SWOT stands for strengths, weaknesses, opportunities, and threats. Strengths and weaknesses are internal factors and opportunities and threats are external factors. A SWOT diagram analyzes a project or business venture by focusing on each of these factors.

#### Strengths

- The product is clearly routed to the interested public
- The organization has strong ethical values an ethical mission statement
- App adapted to use either smartphones or web technologies
- App very easy to use
- Higher speed of execution comparing to large companies due to the fact that startups work with small teams, focused resources, little bureaucracy
- Continuous research to improve the product and the service
- Easy to find advertising companies that will produce the resources needed to maintain the app and help us make profit

#### Weaknesses

- Focused on a very specific market segment

- Need of evolutionary development in order to offer a much wide operation range
- No previous project planning experience
- Lack of patent protection
- Poor reputation among customers
- Difficulties to access bank credits

### Opportunities

- Easy expansion thanks to internet and globalization
- New generations of consumers, value positively a good app
- A growing market segment
- Technological change

### Threats

- In the global internet market, entry barriers are usually low. Existing apps and other bigger companies can barge in the market very easily, and given the fact that they have bigger financial capacity, they can grow very fast.
- Low subventions for Research and Development
- Possibility of entrance of new competitors, such as the companies that sells 3D sensors for other uses
- Software's vulnerability to informatics attacks.
- Lack of patent protection

Due to the boom that informatics applications intended to smartphones and tablets, a lot of people try to get in this new and growing market pursuing business success. For this reason, we wanted to buy a patent to protect us for the competition copying our service. But the European Patent Convention explicitly in article 52 paragraph 2 specifies that informatics applications are not patentable in Spain.<sup>1</sup>

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<sup>1</sup> <http://www.protectia.eu/propiedad-intelectual/patentar-aplicacion-movil/>



## STRENGTHS

- The product is clearly routed to the interested public
- The organization has strong ethical values and an ethical mission statement
- App adapted to use either smartphones or web technologies
- App very easy to use
- Higher speed of execution comparing to large companies due to the fact that startups work with small teams, focused resources, little bureaucracy
- Continuous research to improve the product and the service
- Easy to find advertising companies that will produce the resources needed to maintain the app and help us make profit

## OPPORTUNITIES

- Easy expansion thanks to internet and globalization
- New generations of consumers value positively a good app
- A growing market segment
- Technological change

## WEAKNESSES

- Focused on a very specific market segment
- Need of evolutionary development in order to offer a much wider operation range
- No previous project planning experience
- Lack of patent protection
- Poor reputation among customers
- Difficulties to access bank credits

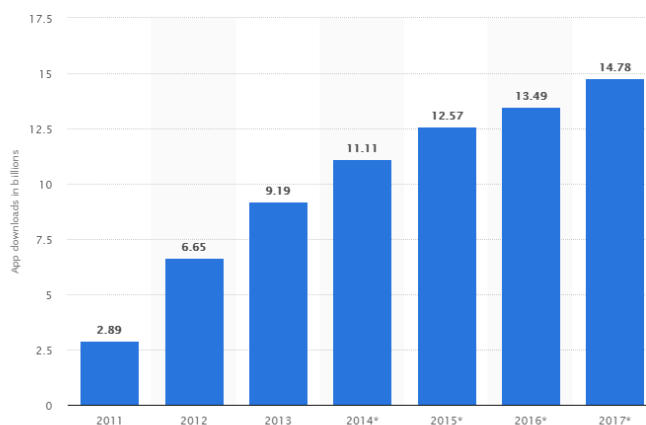
## THREATS

- In the global internet market, entry barriers are usually low. Existing apps and other bigger companies can barge in the market very easily, and given the fact that they have bigger financial capacity, they can grow very fast.
- Low subventions for Research and Development
- Software's vulnerability to informatics attacks.
- Possibility of entrance of new competitors, such as the companies that sell 3D sensors for other uses

## 7.4. PESTEL ANALYSIS

**POLITICAL:** In the political sector, it is believed that BibApp will not have any problem. It is an app that offers a facility for citizens, in particular students. This app does not interfere with politics, but if it is necessary for them to take any position it is think that they will take a favorable one due to the fact that offers a service for the youth they represent.

**ECONOMIC:** As it can be seen in the graphic below, there is a growth tendency when it comes to download paid apps. The country is beginning to abandon the times of economic downturn and this is partly reflected in the increase of paid apps that are download.



Graphic 16. Number of paid mobile app downloads worldwide. Source: Statista

**SOCIOCULTURAL:** The use of smartphones has cause that people are more comfortable using applications for daily actions such as paying, reading news and many others, like now with the use of BibApp for deciding where to study. People do not want to waste time; time cannot be catch up, so there are now a few apps that their aim is to avoid wasting their user's time like BibApp, such as HIKOB, IEM, etc.

**TECNOLOGICAL:** The emergence of new smartphones has made possible the spread of a new business model based on application. The creation of new sensors with high accuracy and the fact of storing live data, giving us the possibility of update data from our app constantly to inform about libraries occupancy in real time.



## **E**COLOGICAL

BibApp does not have any bad ecological impact. For developing our service, it is not necessary anything that pollutes the city. The other way around, it is offered a service for avoid unnecessary commutes. Many students get to a library either by public transport or by their private car or motorcycle. If they go within one of this means of transport and BibApp inform them that the library is full and they do not do the unnecessary commutes, BibApp is doing a positive ecological impact.

## **L**EGISLATIVE

There are not a lot of laws in reference to the service that it is offered. The once that can be applied are laws for protecting people's privacy when it comes to the method of counting how many people are inside a library. If it is used a camera, it is important not to reveal people's identity, but luckily, what is it going to be used are 3D sensors that do not take pictures of people, just recognize the figure of a human, and count how many enter and how many get out the building.





## 8. Marketing Plan

### 8.1. Target customer

Our project initially is addressed to students that we think are more likely to use our app. It is planned to extend the app users to other potential users such as people from other ranges of age that might use frequently libraries. The characteristics of our main starting target group are:

- Age: 16-28 years old

Our users are students that usually go to libraries for studying; it has been considered that the people this project addresses to are youth between 16 and 28 years old. 16-year-old students prepare themselves for 'Selectividad' and it has been seen that many of those gather in groups to study together in public libraries. Students from 18 to 25 study either in universities either Higher Level Training Cycle (CFGS). Taking into account the people that are studying a master's degree it has been established that the upper limit of age is approximately 28 years old.

- Location: libraries around the city of Barcelona

The location of the development of the project, at the beginning, is the city of Barcelona. Particularly, all libraries, public or private, from inside the area of the city. As the app grows and is more popular the location will extend to other cities around the world. It is planned to extend the app first in Catalonia, the rest of Spain, and on a second phase Portugal, France and Germany.

- Gender: Masculine and feminine

Our app targets are either boys or girls. There is no gender restriction in the use of the application.

- Income level: 50/100-1200€ a month

Regarding the income of the different users of the app there is a lot of variance depending on if it is a school student or it is a 26 years old person that had finished his university degree and probably working and studying at the same time.

It has been considered that younger students have an income between the range of 50 to 100 euros getting this amount from their parents or sporadic works such as private lessons or babysitting services. For people that are older and maybe studying a master's degree and working at the same time, it has been considered a little bit more of the average income of people this age in Spain.

The income level is a characteristic that it is not determinative for the evolution of the app but it is important to be considered for the potential sponsors/advertising companies as well as for the possibility of creating a Premium version of the app.

- Education level:

The vast majority of users can be divided into different groups with regard to the education level: High school, university degree, master or PhD. There will also be other users that are a little bit older that they would probably have year of experience in the labor market.

- Occupation:

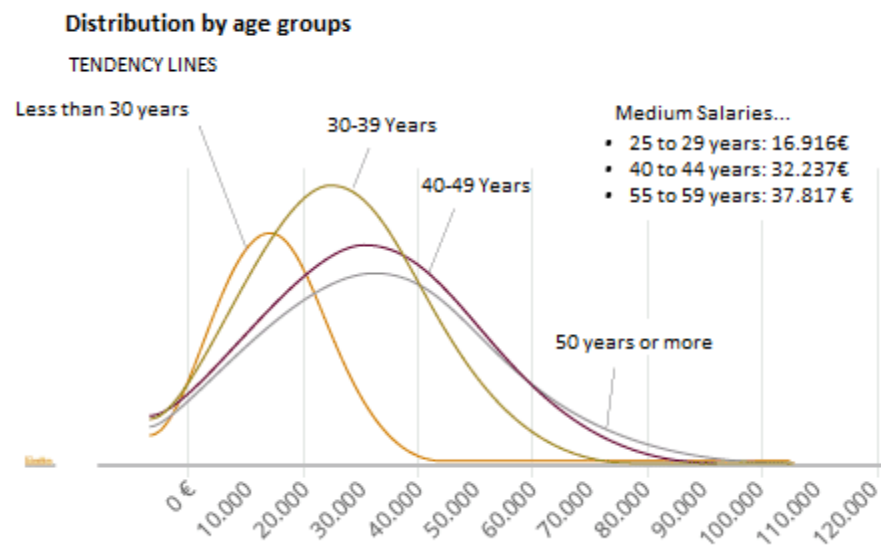
15% of our customers are students from high school, 50 % students are studying for their university degree, 25 % students that are currently doing a master's degree and finally 10% of professors and other people.

From the 50% of students that are in university it is considered that approximately 10% are also doing an internship and from the 25% that are doing a master's degree, between 15 and 20% are also doing internships.

In summary, more or less 55% are full time students and the 40% remaining are both students and employees and the last 5% are employees that may go to libraries for doing



research.



Graphic 17. Salary distribution in Spain by Age. Source: INE

## 8.2. Porter's Five Forces

### Five Forces Analysis (Porter)

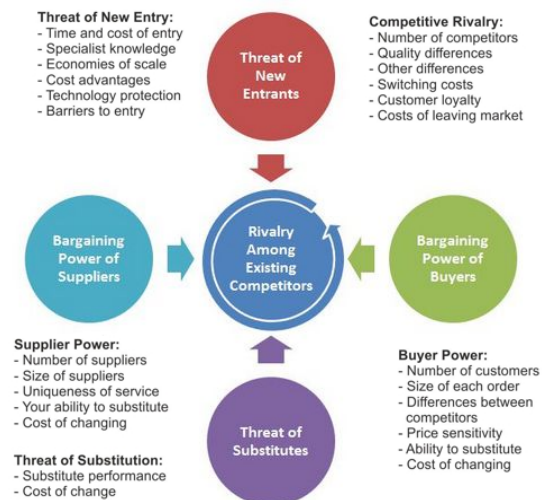


Image 33. Porter's five forces.

Porter's 5 forces is a simple but powerful tool for understanding the competitiveness of a business environment, and for identifying a strategy's potential profitability.

They are essentially a great business concept means by which resources can be maximized and the competition can be overcome. According to Porter if it is not count with a perfect elaborated plan, it is impossible to survive in the business world.

1. Competitive Rivalry: This looks at the number and strength of your competitors. How many rivals do you have? Who are they, and how does the quality of their products and services compare with yours?
2. Supplier Power: This is determined by how easy it is for your suppliers to increase their prices. How many potential suppliers do you have? How unique is the product or service that they provide, and how expensive would it be to switch from one supplier to another?
3. Buyer Power: Here, you ask yourself how easy it is for buyers to drive your prices down. How many buyers are there, and how big are their orders? How much would it cost them to switch from your products and services to those of a rival? Are your buyers strong enough to dictate terms to you?
4. Threat of Substitution: This refers to the likelihood of your customers finding a different way of doing what you do. For example, if you supply a unique software product that automates an important process, people may substitute it by doing the process manually or by outsourcing it. A substitution that is easy and cheap to make can weaken your position and threaten your profitability.
5. Threat of New Entry: Your position can be affected by people's ability to enter your market. So, think about how easily this could be done. How easy is it to get a foothold in your industry or market? How much would it cost, and how tightly is your sector regulated?

### 8.2.1. The competition

Here bellow a list of different applications and services that follow the same goal but have remarkable differences are going to be explained.

In the beginning BibApp will operate in Barcelona, Spain but the idea is to expand as more people use the app to other cities. Since almost the beginning, it is pretended to be a project with a global scope, national and international competitors are studied.



As it has already been seen the market is very big and the development of new Apps is growing very fast. There are a few Apps around the world that their principal idea is the same as ours: Inform about the library state in order to avoid people from not finding a place to study making waste their time.

### APP SPACES

It is an App created by two fourth year management students from Leeds and Edinburgh universities which predicts how likely you are to find a seat in each library. The App works by allowing users to vote on how busy a library is, using a traffic light system. The votes can be seen by other students. They thought crowdsourcing how busy the library is would help people make informed decisions and avoid searching awkwardly for a space when they got there only to be disappointed. The idea is that people who are inside of a library can tap the color that reflects how busy they think the library is at the moment.



Image 34. Screen of APP SPACES

### UNIZAR (UNIVERSITY OF ZARAGOZA)

The webpage works with Fusion Tables which is an App created by Google. They have created dynamic tables with data from all libraries for indicating the library occupancy level. It works with icons that need to be changed by hand and that correspond to all different levels. The library state is changed by the librarian every 2 hours more or less. As it is updated and

rate by a person it indicates an estimation of the library occupancy, it is not an exact measure. It is only working during exam period, during the rest of the year it only informs about if it is opened or closed.

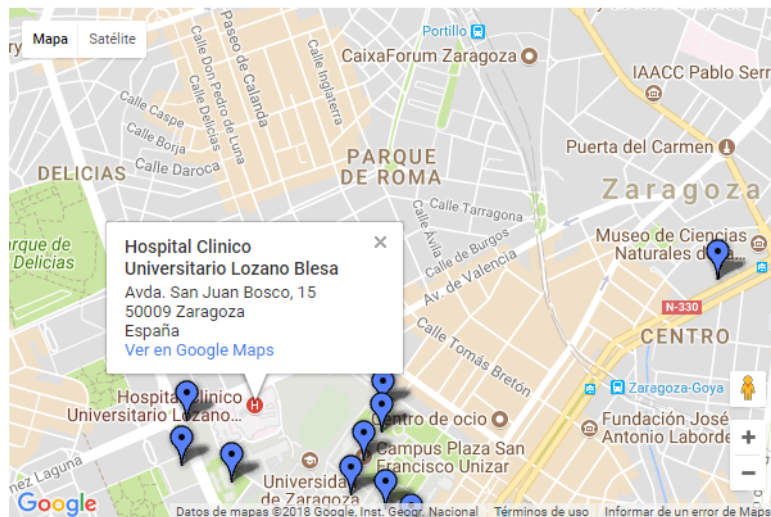


Image 35. Map of Zaragoza's libraries from Unizar.



Image 36. Libraries' state from Unizar

## UNIVERSITY OF SANTIAGO DE COMPOSTELA (USC)

Similar to the idea of UNIZAR. It consists on a Twitter account that informs about the libraries occupancy of University of Santiago de Compostela (USC). In this account it is posted the libraries schedule, open libraries and occupancy level. The account is @BUSCHorarios.





Image 37. Twitter account from University of Santiago de Compostela

## OCCUPANCY MONITORING APP FOR UNIVERSITY LIBRARY

With an university campus App that already existed before, an student with the help of his professor created an iOS app and web service that helps students to find less crowded areas for work and study, in real time and with high accuracy. This was implemented with a new technology that Apple introduced for devices that has iOS 7 or subsequent, that it is called iBeacons. The App can inform of the situation of motorized spots with an associated map.

### 8.2.2. Suppliers

BibApp depends on other people and companies for only two things.

At the beginning, when there is no money for hiring a programmer for developing the app and the web site, a freelance will be hired. There are a lot of freelances that could be hired by BibApp for developing this job. There are a lot of possibilities, when hiring this person responsible for programming the app so if one freelance is hired and is detected that is not the best one or does not know how to the job we wanted him to do, or if he decides to increase prices, is very easy to change and look for a better freelancer.

Also, BibApp depends on another company that is the one responsible for supplying the sensors that BibApp will have installed in libraries in order to count the number of people that are inside the library, for being able to offer its service. It has been studied that there a lot of possible companies that offer sensors that will be useful for BibApp. If the company that is decided to choose for supplying the sensors decides to increase prices or if the sensors are not what our company was looking for, is not very difficult to find another options as there are a lot of different possibilities.

### 8.2.3. Customers

The customers are students that usually go to libraries for studying. They are the source of business, without students that go to libraries; BibApp will not have sense of existence. A

customer is an individual that purchase or use the goods or services produced by a business. Attracting customers is the primary goal of most public-facing business, because it is the customer who creates demand for goods and services.

The challenge is to satisfy the customers demand, to provide them what they are looking for when downloading the app. And when updates are made, increase their satisfaction of the app and not the other way around.

Also, people that are as important as the people that download the app are the companies that are going to fund us in exchange for announcing their products, their brand or their services in BibApp. It is also very important to fulfill their requirements and stick to the pact that is made with them for not losing possible business that found our startup to be able to survive in the market.

#### **8.2.4. Threat of substitution**

Nowadays, the threat of substitution is not very high. Especially in Spain or in Europa. There are no other businesses that offer the same service. For expanding our company first in Catalonia, followed by Spain, later to nearby countries in Europe, etc. as not being anything similar the threat of users changing to another similar app do not exist. If the business get ahead and it is achieved the idea of implementing BibApp services in other continents, in the United States of America are a few apps that follow the same purpose.

In North America exist similar apps that the aim is to inform about libraries occupancy that are develop by university students that are tired of going to the university library on campus and find out there that the library is already full. It can be seen that the idea is the same but they develop the app just for one especial university campus. They are not focused on expanding the app through all libraries around the country.

Even so, as they have the idea and they know how to do it, is very easy for them to expand their business and reach all libraries in the country. If BibApp ever gets the possibility of arriving to the United States and these apps developed by university students expand to all libraries around the country, users could change from BibApp to their app. These apps will be a threat of substitution for BibApp.

But the idea of reaching the United States and that these apps expand their target is very difficult and long term projects. For now, as there are no other applications that offer the





same service, there is no high risk of being replaced by other companies.

### **8.2.5. Threat of new entry**

There are a lot of new business that usually use sensors in order to get a report of how many people enters in a store, a shopping mall or another public place.

It is an option in order to get to know deeply and with detail the most frequent transit area of a store, the client's behavior. It is the perfect allied for the definition of strategies and the decision making that affects directly to a business.

This tool, combines hardware and software of last generation making use of advanced algorithms of intelligence applied.

Knowing what happens inside the store, how many people enter, how much time it takes to purchase something, how many times people passes through a particular spot, which aisle is the most crowded. For all these reasons, a counting people system that it is capable of receiving information in different ways, prepared to distinguish inside a group of people, kids... it is very useful.

It consists on sensors that are installed in stores, software solutions in the cloud that receive, deal and apply artificial intelligence to datum in order to offer insights about a business: evaluate effectiveness, optimize staff labor...

These types of business are a threat for our app because they provide us all the information about the number of people inside the library and generate dashboards with all the information that is it going to use to inform our users about the libraries occupancy.

It is believed that the companies that use sensors in their business are not really important threats because normally these are owners of a shop, a supermarket or a mall. Where these sensors are more used is in stores that sell products in order to analyze client's behavior. As their businesses are not libraries, it is difficult for them to change radically their business vision and target.

Other potential threats of entry are the stores that sell the sensors for counting how many people are inside a particular space.

Nowadays, creating an app is not necessary very difficult. There are several firms that help

you create an app without having to spend a lot of money. For example, Mobile Roadie. The Beverly Hills, California firm offers an automated turnkey platform that gives its clients the ability to build and manage their own customizable iPhone and Android apps in a matter of minutes. Just upload the desired content and information, and Mobile Roadie handles the rest, including the app store submission process. Best of all, Mobile Roadie pricing begins at \$499 for initial setup and \$29 per month for ongoing support.

It is very easy for these businesses to introduce this service much cheaper and easier than us because we depend on them. Nevertheless, introducing this service to this business is an added value because this means they have to enter another market, app producer or business computing. They are not expert in looking for advertisers or addressing to this specific target.

Also, business that do the same but for other markets, for example business that manage the occupancy of parking's. For these apps, it will be easy to expand their services and include people counting in libraries.

For instance, Parker, SpotHero or ParkMe are apps that help you find available spots, prices, and hours for garages. Is it possible to filter parking spots by space, payment type, and more. Built in GPS navigation can guide someone to the nearest open spot. Moreover, these apps help you find and compare parking and reserve a sport for up to 50% off the drive-up rate. Not only it is very easy to reserve one sport from a phone and enjoy discounted rate, but no one need to worry about losing the spot to another diver. There are apps where is it possible to reserve parking up to two weeks into the future.

For these businesses mentioned above, it is believed that as BibApp is willing to expand to as many countries as possible in the shortest time as possible, these companies will have to compete with us that we were first in the market, and it is difficult for them to offer the exact service that BibApp offers.

A possible threat might be a project that a team of researchers from the "Centro de Visión por Computador (CVC-UAB)" and from Florencia University are developing.

This project consists on a new technique based on an algorithm that will allow increasing the accuracy of the estimation of the number of people in a demonstration, concretely for square meter, through static images and video.



The margin of error in this new technique is from 10% to 20%, the lowest until now in this type of estimation. Removing the majority of distortions that are produced in these measures had been removed. For the moment this software is a prototype but the possibility of using it in other activities is being examined. It is because of this that this technique might be a threat for our business. But as the accuracy of this method is much lower than other options that are available for our project, it is believed to be a long-term threat. Also the development of this method is for other spaces and situations.

### **8.3. Marketing Strategy**

Giving the actual rising evolution of technology, a solution of sensors that are capable of relaying information in real time will allow us to have control of occupancy in libraries, avoiding students to waste time doing unnecessary commutes.

The marketing plan is a lengthy document that identifies the target market, provides the situational analysis, the product analysis, the marketing objectives, and the strategies and measurement methods for effectiveness. Marketing is a crucial function in all businesses and organizations, and is becoming increasingly crucial to success in our modern global economy.

The quintessential support will be photography and videos promoting the app, for which a part of the budget will be spent. These photographs will be shared in social media networks and in a web site.

#### Social media networking

As our potential clients are people aged between 16 and 28 years old more or less, it is believed that our strongest way of making the App known are social networks. The usage of social media is increasing exponentially. Social media marketing is a powerful way for businesses of all sizes to reach prospects and customers. Great marketing on social media can bring remarkable success to our business, creating devoted brand advocates and even driving leads and sales.

BibApp will have active accounts on: Instagram, Facebook and Twitter. Constantly updating changes, to show the product and the different options that our business offers to people by posting text and image updates, videos, and other content that drives audience engagement. It is important to make sure that there are regular posts and that the offer truly valuable

information that our customers will find helpful and interesting.

It is decided to measure success with analytics, for this goal it is necessary to track data. "Google Analytics" can be used as a great social media marketing tool that will help measuring our most triumphant social media marketing techniques, as well as determine which strategies are better off abandoned. Tracking tags will be attached to our social media marketing campaigns so that they can be properly monitored. The analytics will be used within each social platform for even more insight into which of our social content is performing best with our audience.

### LinkedIn

An account on LinkedIn will also be created because is the most professional social media marketing.

LinkedIn provides analytical tools that tell you how many times your posts appeared in front of a follower on their device, the number of clicks your post generated as well as the number of interactions your post received. These statistics are not available for individual users.

It will also be used to promote our most important news. With a company page in LinkedIn it is possible to select the most important post and pin it to the top of the page's news and it will remain there until it is choose to unpin it, instead of other social networks where the information just disappears with the past of time.

The aim of using social media accounts for advertising BibApp is to share our service, our updates such as new libraries that count with this service, new improvements... but also to get to know the company, our values, and our goals.

### Create a website

A website can be used to accomplish many different marketing strategies to help the business grow. It is online and accessible 24 hours a day, every day of the year. Because of this, customers and potential customers can visit the website for support or information about our service and upcoming updates whenever it is convenient for them.

It is important to make sure that the website is logical, easy to use and that contains contact information so potential clients can reach us to be informed about our project. The website will also be a mobile ready version because smartphone are everyday more used and a lot of



people search for information on their smartphone or tablet.

To get more visits to our website, motivate our clients, and provide contact information Google AdWords will be used to specifically target the type of services that we offer. We will focus on the quality of a few keywords instead of choosing too many. AdWords are great for targeting specific geographic locations and give the ability to control our budget with flexible pricing options.

Google AdWords is Google's advertising system in which advertisers bid on certain keywords in order for their clickable ads to appear in Google's search results. The key to how Google AdWords works is the Quality Score. Quality Score is generally how well an ad group, keywords, ad, and landing page relate to what a person is searching for, and how likely someone is to click on the ad.

Every time someone does a search on Google, and AdWords auction is created. Every advertiser who has a keyword match to the search query competes in the auction. How well each advertiser competes is based on their Ad Rank.

$\text{Ad Rank} = \text{Quality Score} * \text{Bid}$

Ads are placed in order based on Ad Rank. The highest Ad Rank gets the top spot and so on down to either the last ad qualifying for the auction or the last position on the page.

#### Create a publicity campaign in universities

For explaining this way of advertising, ETSEIB (UPC) University will be used:

- Create and advertisement and place it on the screen background of all computers of the university.
- The most important sector of our users will be students that go to school or university. All high schools and universities have a way of communicating with students almost weekly. An example, in our university, ETSEIB, UPC all students receive a message weekly from "Comunicació ETSEIB" informing about news of the week: conferences, special events, reminders...

BibApp will be announced different times, with the most important information in order to be known by students. It is believed that the most important time for announcing the app is at the beginning of the semester, so the people is aware of

the existence of the app, and especially a few weeks before starting exams, either finals or midterm exams.

- The app can also be announced in the webpage of the school and the different libraries, or in the virtual campus of the university or school. This is make not only to ensure that every student is aware of the existence of the app, but that all students are reminded from time to time that they can use this app in order to offer them a service and facilitate them their organization of time during exams periods especially.

A QR will be posted in these pages so that students can directly go to App Store of Google play and download the app the simplest way as possible.

In order to make ourselves known it is important to advertise. It is necessary to tell people who we are, why our service is unique and different from the competition and how can the people find us. More than anything, we will focus on consistent, repetitive branding. In today's world of constant connectivity, we must make sure that we are seen and heard.

For these reasons, in order to get BibApp known by all students the following advertising ways are going to be developed:

#### Create a QR code

QR codes provide a super quick way for students to download the app. Embed a link that drives them directly to the app's page in the appropriate app store. Include the QR code on posters, advertisements, info cards, postcards, or on any other printed materials students will see.

#### Create a promotional video

Videos are a great way to show off a sense of humor and promote sharing. Make a creative, funny, thought-provoking or personal video. Telling the story, but in a way people can identify with.

#### Promote the app in person



Hand out flyers or promotional materials, giveaways to generate interest and hang posters around universities and schools. Giving live demos and trying to get students to download the app right there. The best dates for doing that, is a few weeks before exams, when students start to go to libraries to study, during the beginning of the year and in events such the one that it is hold in our university, Forum ETSEIB where students are around the university getting information for different business in order to find a job or an internship.

#### Announce new events and features with push notifications

Ensuring users continue to engage with the app is just as important as gaining initial traction. Push notifications are an excellent way to keep the users engaged. Push notifications are used to alert users of important events or new features within the app.

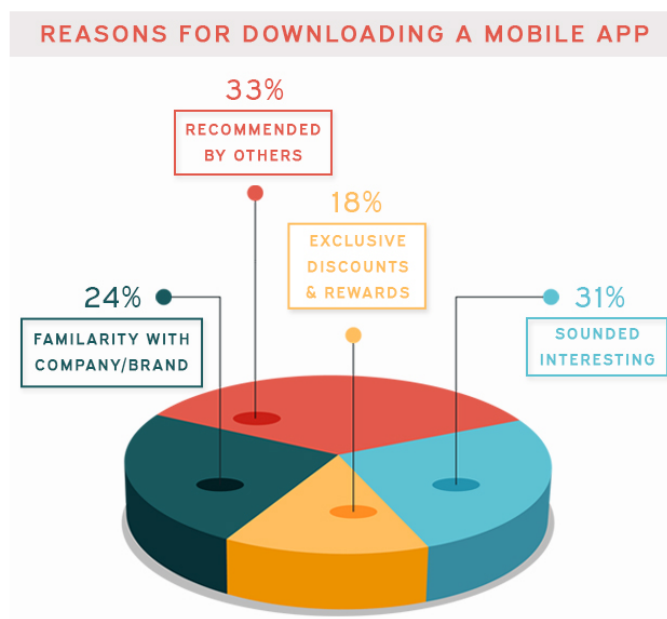
#### Reach out to influencers

Influencers usually are young and attractive persons, who create a rich social media fantasy life, into which they will slip a flowing reference to one product in exchange for free stuff or a small fee. This allows creating an ad without hiring models or photographers. It also allows potential customers to see a product not in the harsh light of some studio but in situ, in the glamorous life of an actual person.

Influencers are so called because they have an influence over potential customers. They are leaving a mark on them channelizing their thoughts and buying decisions. They converse with their audience through posts and engagements that are relatable individualized and trustworthy.

The idea is that the influencer creates sponsored posts on behalf of the brands to share with their own audience and followers. Making our new app known by their followers. After achieving this, the goal is to continue expanding the advertising of BibApp through word-of-mouth marketing, in order to get to as many people as possible. McKinsey found that word-of-mouth marketing brings in more than twice as many sales as traditional advertising.

In the graphic below, it can be seen that 33% of people downloads an app because it is recommended by other people such as influencers or friends.



Graphic 18. Reasons for downloading a mobile app

### Apply for awards

Participating in app awards is the most recommended channel and it is suggested to take advantage of it. It can give tons of press, exposure, reviews and plenty of downloads. Although the chances of winning are difficult and depend on the app idea and development, it is possible to manage things right and obtain a little stardom.

### SEO (Search Engine Optimization)

Search engine optimization is anything done to improve the ranking of a website on search engine results pages (SERPs). There are a lot of enterprises that their main goal is to increase their website visibility or traffic and ranking high for targeted search terms or phrases on search engines

Is a methodology of strategies, techniques and tactics used to increase the amount of visitors to a website by obtaining a high ranking placement in the search results page of a search engine (SERP) – including Google, Bing, Yahoo and other search engines.

Search Engine Optimization or SEO is activity of ensuring a website can be found in search engines for words and phrases relevant to what the site is offering.

Search engines like Google and Bing are the librarians of the internet. Their systems collect





information about every page on the web so they can help people find exactly what they are looking for, and every search engine has a secret recipe called an algorithm for turning all that information into useful search results.

When you own a website, search results matter when your pages have higher rankings they help more people find you.

The key to higher rankings is making sure a website has the ingredients search engines need for their recipes; this is called search engine optimization or SEO.

In addition, it is a great way to increase the quality of a website by making it user-friendly, faster and easier to navigate.

In today's competitive market, SEO marketing is more important than ever. Search engines serve millions of users per day looking for answers to their questions or for solution to their problems.

Search engine optimization is essential because the majority of people are more likely to click on the 5 top suggestions in the results pages (SERPS). Also, practicing SEO improve the experience of the users and makes the web site more user friendly, so more people are able to use it. Furthermore, users tend to trust in search engines so, having a website in one of the top positions when users search in internet their keywords, increase the website's trust. This is also good for social promotion; people who find a website in the first positions of its search are likely to promote it on Facebook, Twitter, or any other social media.

SEO is a way of putting a company away of its competition. If two companies are offering the same service or selling the same product, the company with search engine optimized website are usually more likely to have more visitors and traffic on their website, this leads to having more sales and users.

SEO is not a static process but rather a framework with rules and processes. SEO can be broken down into 2 main stages:

- On-site SEO: What rules to apply on a site to make it search engine friendly

- Off-site SEO: How to promote a website or blog so that it can rank better in search results.

## On-site SEO

These are tweaks that can be applied to a web site and increase the search engine visibility. A few examples are:

1. Page Titles and description. The most important characteristics of an optimized page title are:
  - Each page needs to have a single and unique page title that describes explicitly the page's content
  - It is important not to be extensive and be descriptive
  - Help users to understand what the page is offering

The guidelines for writing a good description are:

- The description of each page must be unique for all pages, post, products of your website
  - The size of the description must be between 140 and 150 characters
  - The title must not be repeated in the description
  - It is important not to add a lot of keywords.
  - The description must be used as a way for advertising the page and attracting people to click on it for visiting the web site and seeing what it is offered.
2. Permanent link structure. The permanent link structure is a term used to describe the format of URL'S for pages of a web site.

SEO Guidelines for URLS:

- URL's must be simple and easy to understand by users and search engines.



- It is recommended to use hyphens ‘ – ’ to separate the words that make up a URL
- Avoid unnecessary information in URL's that leads to a lengthy URL's
- Use words that describe what the page is about but avoid keyword stuffing

### 3. Breadcrumb

Make sure that you have a breadcrumb on all your internal pages. A breadcrumb is a set of links at the top of the page that aid navigation.

### 4. Text formatting and the use of H1, H2 and H3

Before publishing text on a website, it is necessary to first doing some basic formatting. Otherwise, it will have a bad impact on the user's experience and works against SEO efforts.

General guidelines for formatting a post or page on your website:

- Use H1 tags for the title of your post
- Use H2 tags for the main headings of your post.
- Use **BOLD** and *Italics* to draw users' attention
- Don't use H2 tags for all your headings
- Write small paragraphs
- Use a font size that is easy to read

### 5. The 404 Page

SEO is about improving the user experience and a proper 404 page contributes to this goal. The 404 page is the page shown when a user is looking for a page on the site that does not exist or mistypes a URL or follows a broken link.

A properly configured 404 page should:

- Instead of displaying “Not found”, give some information to the user of what happened

- The design of the 404 page must be according to the rest of the design of the web site
- Give options to the user to navigate to other pages of the site

## 6. Image Optimization

Images are always very useful and necessary to improve the experience of users in the web site, but it is necessary to take care because if there are many images, it is very possible to create problems with page loading speed, slow responses, etc. If it is decided to use images, take into account the following statements:

- For describing the image, use Alt Text. It is possible to add keywords but do not overdo it.
- Use keywords in image filenames (separated with dashes). Avoid using filenames like image1.jpg or person1.jpg. Instead use meaningful names with dashes.
- Optimize the image size. If the size of the image is very big (in KB) the web site will be slower.

## 7. Mobile friendly web sites

It is key that the website is possible to use it through mobile devices. A huge number of searches that are performed daily are through mobile devices. There are a lot of recent studies that prove that the numbers of searches through mobile phones are tightly increasing.

## Off-site SEO

Search engines optimization try to find the most important pages to show first when a user enters a search query in internet. The number of incoming links is one important factor that determines the position in which a web site will appear once the search is done. Incoming links can affect enormously in a ranking website's position due to the fact that are a signal of trust.

It is the part of SEO that focus on external factors of the web site. Including external



links, social signals, mentions and other metrics that reinforce the page's authority.

#### Ask for app reviews

This is the moment when consumers can leave an opinion about a product. It is crucial because the developer can see the strongest points of the app and the ones which should be improved. Also, a great rating and a bunch of positive reviews impresses potential users.

### **8.4. Logo design**

A logo is an effective pictorial representation of a brand that encapsulates the ethos and nature of the business in one swoop.

The purpose of the design of the logo is to reflect the brand as well as its goals. Ensure that a professional logo has been created.

It is not just the design, but the choice of colors and other elements where it is achieved the expected message sent with the logo.

From color to shape to words, every element in a logo design says something. That is the reason why it has been carefully chosen all the components and colors of the logo. The idea is to transmit the following adjectives:



*Image 38. BibApp's logo*

### Simple

It is decided to create a simple logo in order to be easy to remember. Because a logo with too much unnecessary elements is going to fade away from the eyes, making it useless for branding.

A logo messed up with too much extra customization and usage of components always set confusions instead of drawing attention. The idea is to communicate the things the app does in an instance. But within that instance, if it is trying to say extra things, it is much more likely that customers will not get the message, or they will get the wrong message.

Also, it has been decided to create a simple logo in order to transmit that our business is an easy to use app.

### Appropriate

The primary role of a logo is to identify the person, product, business or service it is designed for. That is why it is wanted that the logo is an accurate representation of the company and the service that is offered. It has a meaning that is unique to what we do. It is desired to communicate what it does with just the picture of the logo. It is believed that with this logo is it shown what it is offered.

- The book: it symbolizes that the app is related to libraries. Because almost everybody associated a book with a library, with studying, etc.
- The graduation cap: represent the students that go to libraries for studying. Those are the users and sense of existence of the app.

It was decided to add a clock in the brands image, because what BibApp does is avoid wasting student's time, but the design was too much charged, and it has been decided to create a logo where simplicity predominates.

### Targeted

With the design of this logo it is tried to connect with the people that it is going to use the app. It is neither a very serious design nor a childlike scheme. It is attempted to talk to target audience through the logo. Students and books (libraries) are connected. It has been related both most important concepts in our business.



### Versatile

When designing the logo, it is important to be mindful of its usage.

The logo will be resized onto different surfaces and materials, such as letterheads, banners, business cards, websites, app image... it has been picked a logo that is effective at any size and compatible with the most backgrounds as possible.

### Color

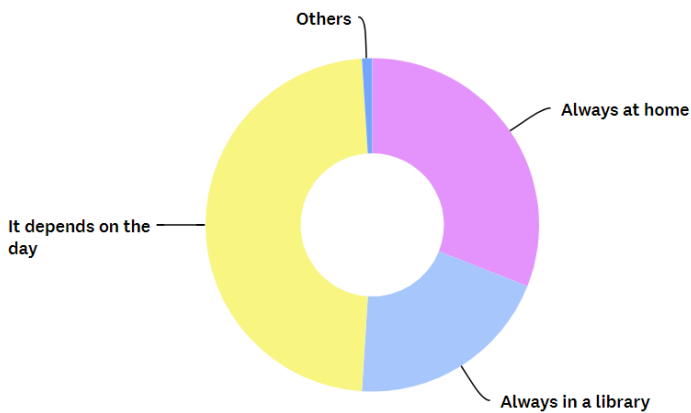
The color of the logo has been decided to be blue because of blue symbolizes constancy, authority and trust. It is a relaxing color and it is related with the mind, specifically, with the most intellectual part of it. It makes people feel calm, relaxed and protected from all scandals.

Giving the fact that the app is related with studying it is more appropriate a color that transmits this kind of sensations instead of one more aggressive which will not be correctly associated with the purpose of the app.

## 8.5. Downloads forecast for the upcoming years

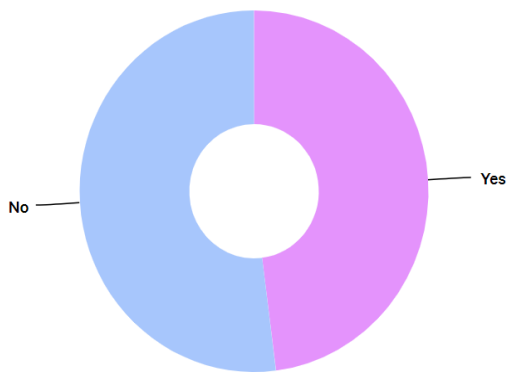
A survey was made to more or less 250 university students from different universities to more or less have an idea of how many people study in a library, to see if they have experienced the problem that BibApp is trying to solve, and how much they are willing to be able to use an app that informs about the libraries occupancy for not having to waste any time when studying.

1. Where do/did you usually study?



Answering options	Answers
Always at home	31,00%
Always in a library	20,00%
It depends on the day	48,00%
Others	1,00%

2. Do/did you go always to the same library?

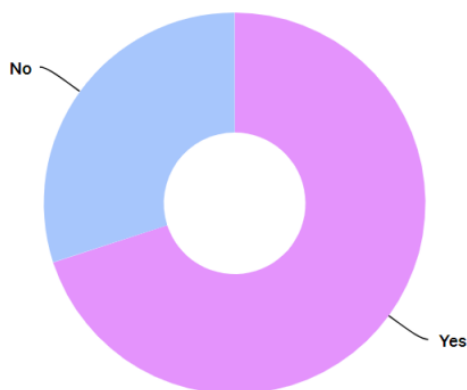


Answering options	Answers
Yes	48,00%
No	52,00%



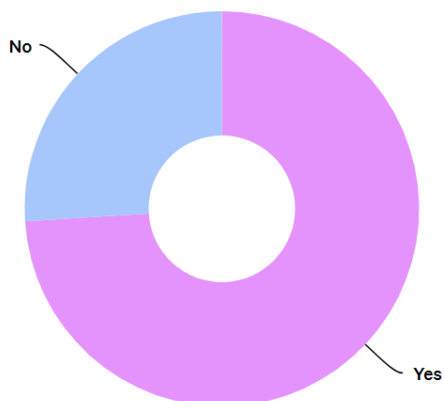


3. In any occasion were you left without a place to sit?



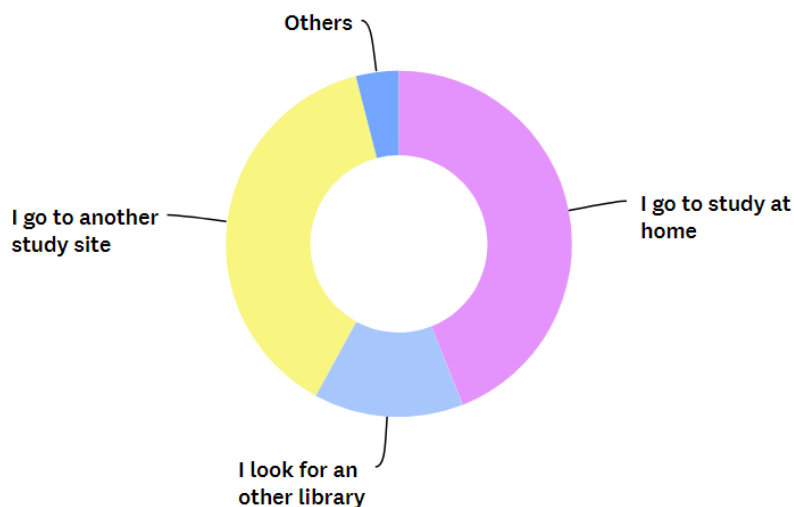
Answering options	Answers
Yes	70,00%
No	30,00%

4. Do/did you keep a sit to your friends?



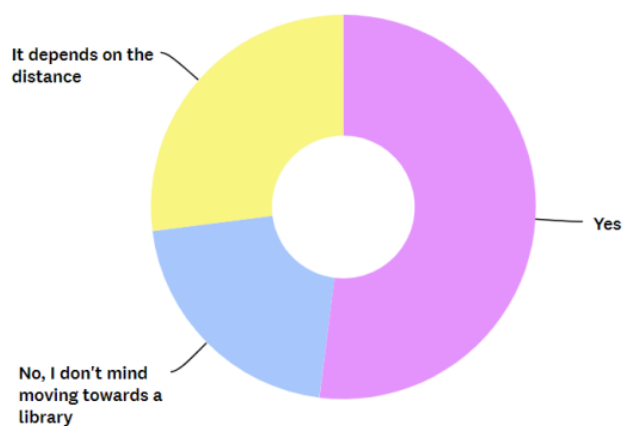
Answering options	Answers
Yes	74,00%
No	26,00%

5. What do you do/did if you don't/ didn't find a place in the library?



Answering options	Answers
I go to study at home	44,00%
I look for another library	14,00%
I go to another study site	38,00%
Others	4,00%

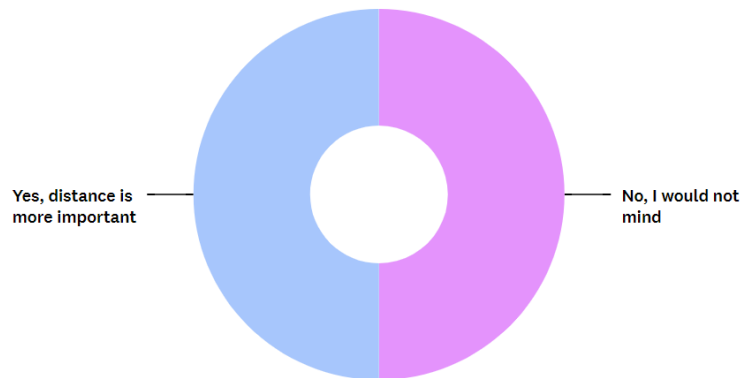
6. Do you think is very important where the library is located?



Answering options	Answers
Yes	52,00%
No, I don't mind moving towards a library	21,00%
It depends on the distance	27,00%

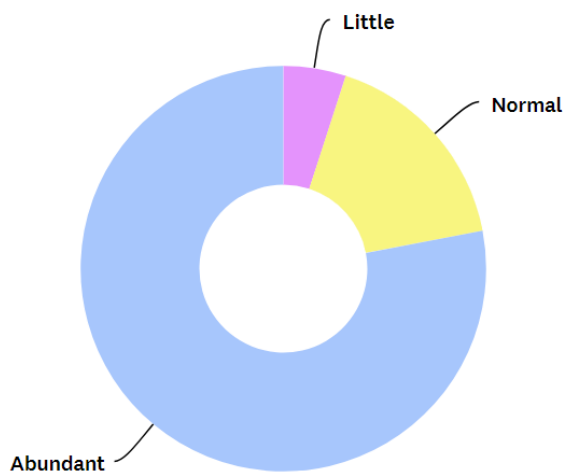


7. Would you mind going to a library that is a little bit far if they assure you that you would have a place to sit?



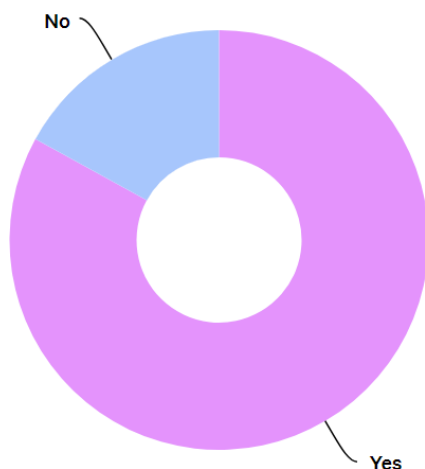
Answering options	Answers
No, I would not mind	50,00%
Yes, distance is more important	50,00%

8. What paper do you believe apps will have in the future?



Answering options	Answers
Abundant	78,00%
Little	5,00%
Normal	17,00%

9. Would you download an app that informs you about the occupancy of libraries?



Answering options	Answers
Yes	83,00%
No	17,00%

To summarize the different answers, the majority of students usually study in a library, although a lot of them usually study in the same library, there is much people that changes the library where they go to study. For BibApp, this is a good sign because it is shown that a lot of people could choose where to study using the app.

Also, the vast majority of students have experienced the anger and stress of going to a library where there was already full and they had to find another place for studying. From these students that are left without a sit in the library, they either find another library or place to study, or they go home for not taking the risk of not finding place either.

BibApp is thinking of expand its utilities to catch more people's attention, given the answers, the first think that is it going to try to be done is include the possibility of saving a place in a library in advanced, as the majority of students usually save sits to their friends.

Moreover, it is seen that students normally care about where the library is located and if the library is far from their homes they might not go. But, when they know that there is a place to study for them, it is less important if the library is not as close as what they would like. BibApp will be the one telling them this occupancy information. Also, students can use BibApp to know that there are other libraries close to where they are and also empty, but that they do not know that existed.



Finally, it is clearly shown that students believe in the future of apps, and that if they had the possibility of using an app that informs about the libraries occupancy, the overwhelming majority will download and use it.

### 8.5.1. First Years

Given the survey results and having analyzed the market that BibApp is targeting is it going to try to estimate as accurately as possible the downloads forecast of BibApp.

There is a total of 5.81 millions of students in Spain approximately between the age of 16 and 28 years old. From this total, in the survey made to students from different universities, 83% of them are interested in downloading an app like BibApp.

As there are no other applications that offer the same services as ours, is it going to be assumed that all interested persons are going to download and try BibApp.

Before generalizing the study to all students in Spain, first we are going to focus on people that study in Catalonia. Approximately, there are 1.152.065 people between the ages of 16 and 29 years old in Catalonia<sup>2</sup>. From this total, the following are enrolled in one institution for studying the following kind of studies:

Type of studies	Number of Students
Enrolled University Students	207.663
Enrolled Master Students	34.271
Enrolled PhD Students	16.745
Enrolled CFPS	29.028
<b>TOTAL</b>	<b>287.707</b>

Table 6. Number of students per type of studies at university

<sup>2</sup> <http://www.bcn.cat/estadistica/catala/dades/anuari/cap02/C020104.htm>

To this total, is it going to add the estimated number of students that are in Catalonia participating in the Erasmus Program: Approximately 4000 students just in Catalonia in 2014.<sup>3</sup>

Students Nationality	Number of Students
Number of Spanish students in Catalonia	287.707
Number of foreign students in Catalonia	4.000
<b>TOTAL</b>	<b>291.707</b>

Table 7. Number of students per students' nationality

Also the number of students that are currently studying baccalaureate and a medium grade course between the ages of 16 and 19 years old it is a total of 33.25%<sup>4</sup> and the percentage of students pursuing a Medium Grade Course is 31.37%<sup>4</sup> from a total of 278.035<sup>5</sup> students.

Type of studies	Number of Students
Studying Baccalaureate	92.441
Studying a Medium Grade course	59.396
<b>TOTAL</b>	<b>151.837</b>

Table 8. Number of students per type of student not at university

Finally, there is also a minority of people older than 28 years old that are studying; these people might also go to libraries for studying. There are a total of 36.000<sup>6</sup> approximately.

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<sup>3</sup>[http://ec.europa.eu/dgs/education\\_culture/repository/education/library/statistics/2014/erasmus-receiving-institutions\\_en.pdf](http://ec.europa.eu/dgs/education_culture/repository/education/library/statistics/2014/erasmus-receiving-institutions_en.pdf)

<sup>4</sup> <http://ensenyament.gencat.cat/ca/departament/estadistiques/xifres-clau/>

<sup>5</sup> <https://www.idescat.cat/pub/?id=aec&n=253&lang=es>

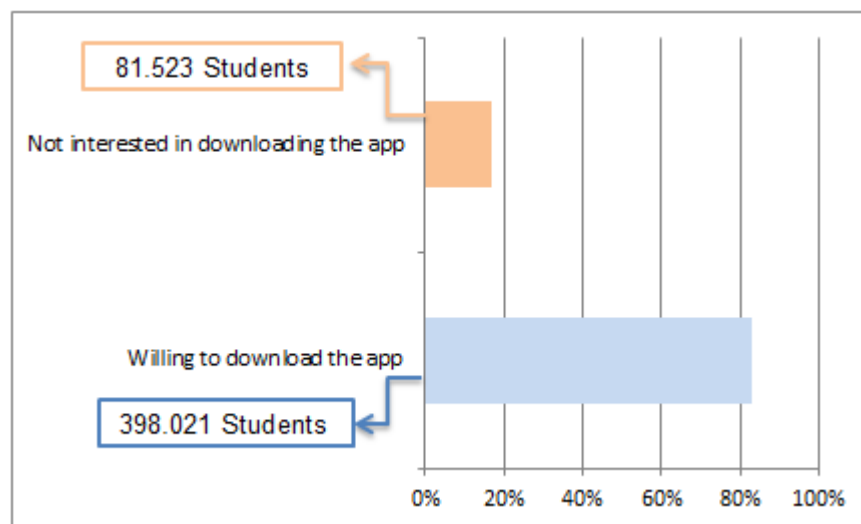
<sup>6</sup> <https://www.idescat.cat/pub/?id=aec&n=763>



Potential Users	Number of Students
University Students	291.707
High school and Medium Grade Students	151.837
Adult Education	36.000
<b>TOTAL</b>	<b>479.544</b>

Table 9. Number of potential users.

Having the approximate total number of students in Catalonia it can be now estimated the number of downloads that BibApp will have with the results of the survey:



Graphic 19. Number of students willing to download the app

#### 8.5.1.1. Average Scenario

From this total of students that are interested in downloading the app it is supposed that only the 25% of the people are going to do it during the first year.

It has been considered a 25% of downloads because of the low number of possible users, at first the app is unknown so it will not have a lot of downloads during the first months.

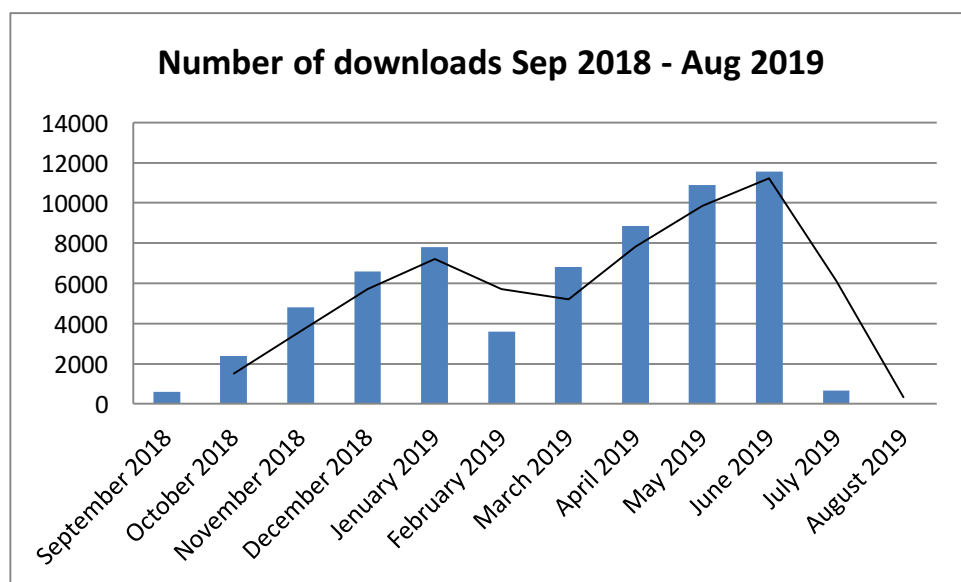
Of the total of 207.663 university students in Catalonia, 182.073<sup>7</sup> study in Barcelona (including outskirts of the city). Extrapolating this number, the percentage of the total

<sup>7</sup> <https://www.idescat.cat/pub/?id=aec&n=753>

students in Catalonia that study in Barcelona is approximately an 87.5%. For this reason, the students that will have access during the approximately 6 first months is a little bit low, this also explains the lower downloads during the first months.

Also, this estimation is based on a survey made to a little part of potential clients and, normally these surveys are not 100% reliable. The reliability of these surveys tend to be small, so instead of assuming an 83% of downloads; it has been considered a much little number for the first year.

From the total of potential clients estimated before, it has been subtracted the number of students that are in high school or pursuing a Formative Cycle of Average Degree, being this number a total of 272.000 potential users.



Graphic 20. Number of downloads of the first year. Source: own elaboration.

The explanation of this strange line of tendency for the number of downloads during the first year, is that during the first months, September, October and November the app just have been launched and only in Barcelona's University libraries, so downloads are low. Also this short number of downloads is due to the fact that it is the beginning of the school year so people do not go very often to the library.

It can be seen that during the months of December and especially in January the number of downloads increase exponentially. The time passed sin the app was launched is





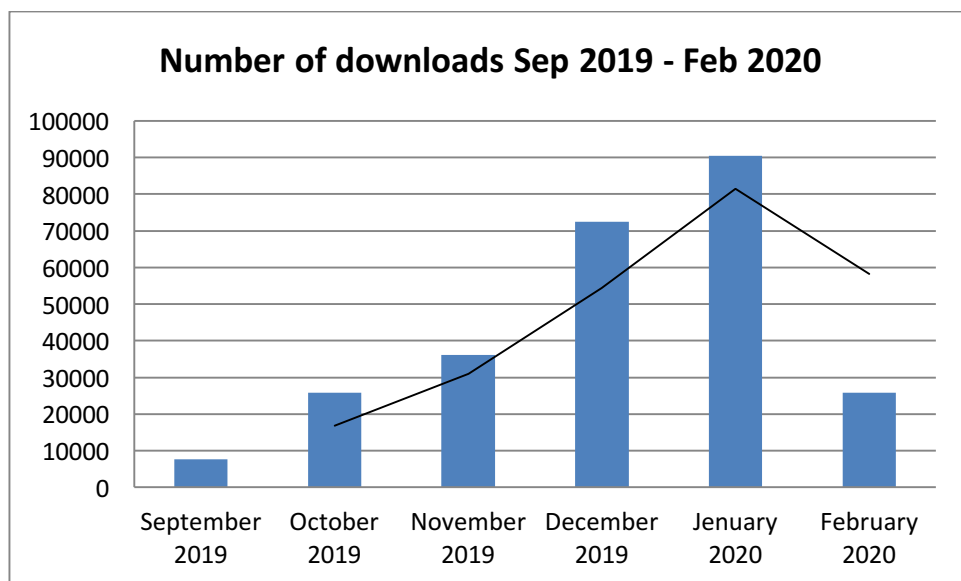
enough for being known by several number of students, and also and more important, these months are where people studies more, because they are typical months of exams.

For the same reason mentioned before, during the months of especially February and March the number of downloads decrease, since there are not many exams during these months, peoples attendance to libraries reduces.

April, May and June are as December and January, as the app is every time known by more students and they have to study the more, the result is an increase of BibApp downloads.

Finally, as July and August are holiday months in the academic year, the number of downloads is approximately null.

The forecast of downloads for the following 6 months gathered is the following:



Graphic 21. Number of downloads of the second year. Source: own elaboration

The tendency line of this graphic is the same as the graphic from the first year.

The estimated downloads for the following 6 months is 15% higher from the first one. It is believed that the second year of BibApp will reach to more or less a 65% from the total potential clients estimated above in the survey.

The number of downloads for the second year is higher than the first one because as time passes by, the app will be expanded to more libraries and in consequence, is going to be known by more people.

The total number of potential clients during the first months of the second year is going to be approximately: all the potential clients for the second year plus all high school students and also the ones that are doing a Formative Cycle of Average Degree. This leaves a total of 479.554 students. For the following 6 months, BibApp will continue to grow to all university libraries around Spain.

For estimating the number of downloads for the last 6 months of the second year and the first 6 months of the third year it is done the following analysis:

In Spain there are a total of 1.284.041<sup>8</sup> university students, 190.143<sup>9</sup> students pursuing a master's degree, 353.920<sup>10</sup> students doing a Higher Level Training Cycle (CFGS) and finally, there are a total of 71.548<sup>11</sup> students doing a PhD. Knowing this, it can now be estimated the total downloads that BibApp will have during the 6 last months of 2020.

Potential Users	Number of Students
University Students	1.284.041
CFGS Students	353.920
Master's degree Students	190.143
PhD students	71.548
<b>TOTAL</b>	<b>1.899.652</b>

Table 10. Spanish potential users. Source: own elaboration

<sup>8</sup>[http://estadisticas.mecd.gob.es/EducaJaxiPx/Datos.htm?path=/Universitaria/Alumnado/Estadistica/2016-2017/1GradoCiclo/Capitulol/I0/&file=mat\\_4\(2\).px&type=pcaxis](http://estadisticas.mecd.gob.es/EducaJaxiPx/Datos.htm?path=/Universitaria/Alumnado/Estadistica/2016-2017/1GradoCiclo/Capitulol/I0/&file=mat_4(2).px&type=pcaxis)

<sup>9</sup>[http://estadisticas.mecd.gob.es/EducaJaxiPx/Datos.htm?path=/Universitaria/Alumnado/Estadistica/2016-2017/2Master/Capitulol/I0/&file=mat\\_1.px&type=pcaxis](http://estadisticas.mecd.gob.es/EducaJaxiPx/Datos.htm?path=/Universitaria/Alumnado/Estadistica/2016-2017/2Master/Capitulol/I0/&file=mat_1.px&type=pcaxis)

<sup>10</sup><https://www.mecd.gob.es/dms/mecd/servicios-al-ciudadano-mecd/estadisticas/educacion/no-universitaria/alumnado/formacion-profesional/Nota-15-16.pdf>

<sup>11</sup>[http://estadisticas.mecd.gob.es/EducaJaxiPx/Datos.htm?path=/Universitaria/Alumnado/Estadistica/2016-2017/3Doctorado/Capitulol/I0/&file=DOCT\\_4.px&type=pcaxis](http://estadisticas.mecd.gob.es/EducaJaxiPx/Datos.htm?path=/Universitaria/Alumnado/Estadistica/2016-2017/3Doctorado/Capitulol/I0/&file=DOCT_4.px&type=pcaxis)



Also, there are a total of 156.269<sup>12</sup> Erasmus students in Spain that may also go to university libraries.

The exact number of adult education in Spain was not possible to find, to estimate this number is it going to be used the number of adult education in Catalonia, and the percentage of Catalanian population regarding Spain population. Catalanian population is approximately a 16% of Spanish population, so if in Catalonia there is a total of 4.000 adult students approximately, it is estimated that in Spain there is a total of 25.000 adult students. For ensuring numbers and not considering more downloads of the actual downloads, is it going to estimate that the total number of adult education is 20.000.

Finally knowing this datum, the number of total students in Spain for estimating downloads that BibApp will have during the 12 following months of the year is:

Potential Users	Number of Students
University Students	1.284.041
CFGS Students	353.920
Master's degree Students	190.143
PhD Students	71.548
Erasmus Students	29.066
Adult Students	20.000
<b>TOTAL</b>	<b>1.948.718</b>

Table 11. Spanish potential users. Source: own elaboration

Also, the number of students that are in high school or cursing Formative Cycle of Average degrees are included in the estimation of downloads for the following year:

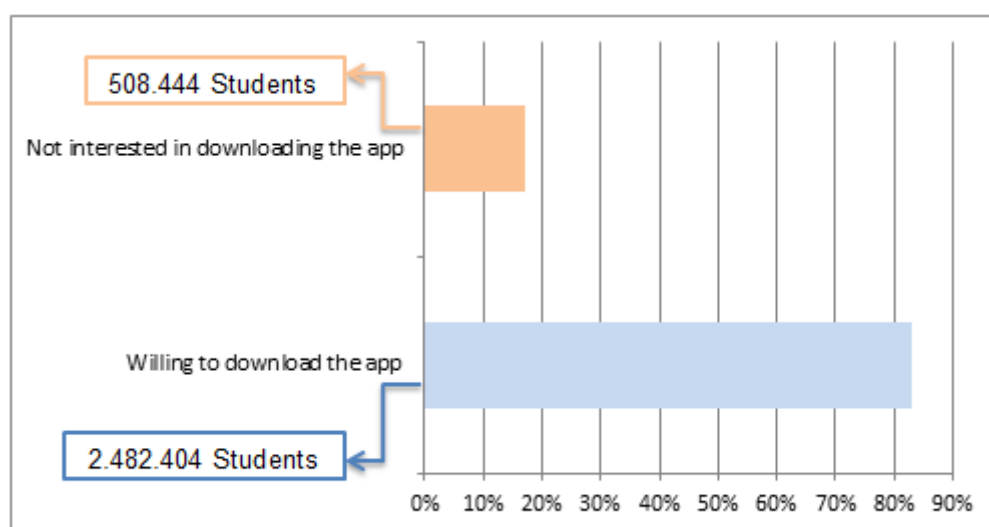
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<sup>12</sup>[http://ec.europa.eu/dgs/education\\_culture/repository/education/library/statistics/2014/erasmus-receiving-institutions\\_en.pdf](http://ec.europa.eu/dgs/education_culture/repository/education/library/statistics/2014/erasmus-receiving-institutions_en.pdf)

Potential Users	Number of Students
All Students calculated before	1.948.718
CFGA Students	349.631 <sup>13</sup>
High School Students	692.500 <sup>14</sup>
<b>TOTAL</b>	<b>2.990.849</b>

Table 12. Spanish potential users. Source: own elaboration

From this total the potential clients for downloading the app are the following:



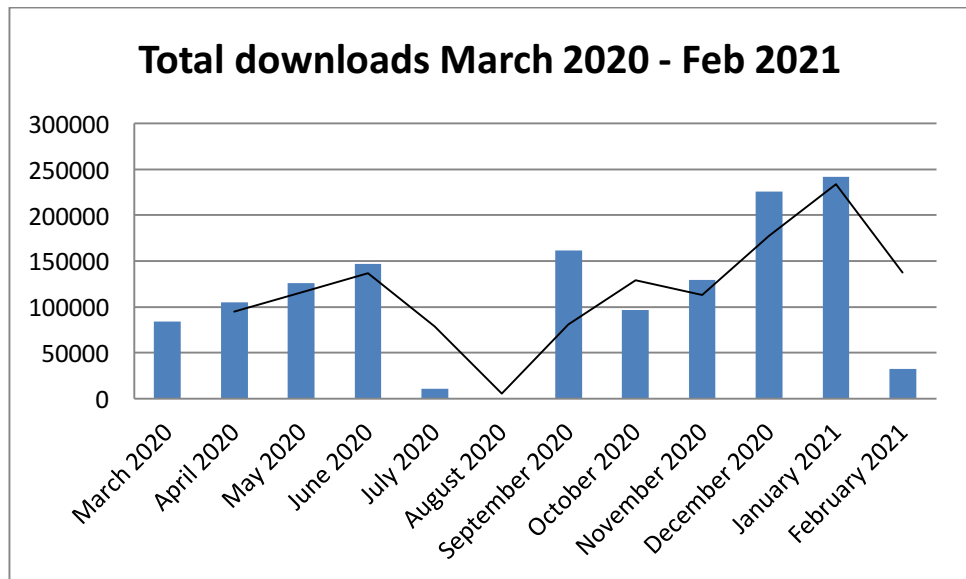
Graphic 22. Students willing to download the app. Source: own elaboration

So, it can now be estimated the number of downloads that BibApp will have between the period of March 2020 and February 2021, with the scenario that is it going to be reached the 65% of downloads:

<sup>13</sup><https://www.mecd.gob.es/dms/mecd/servicios-al-ciudadano-mecd/estadisticas/educacion/no-universitaria/alumnado/formacion-profesional/Nota-15-16.pdf>

<sup>14</sup><https://www.mecd.gob.es/servicios-al-ciudadano-mecd/dms/mecd/servicios-al-ciudadano-mecd/estadisticas/educacion/indicadores-publicaciones-sintesis/datos-cifras/Datosycifras1718esp.pdf>



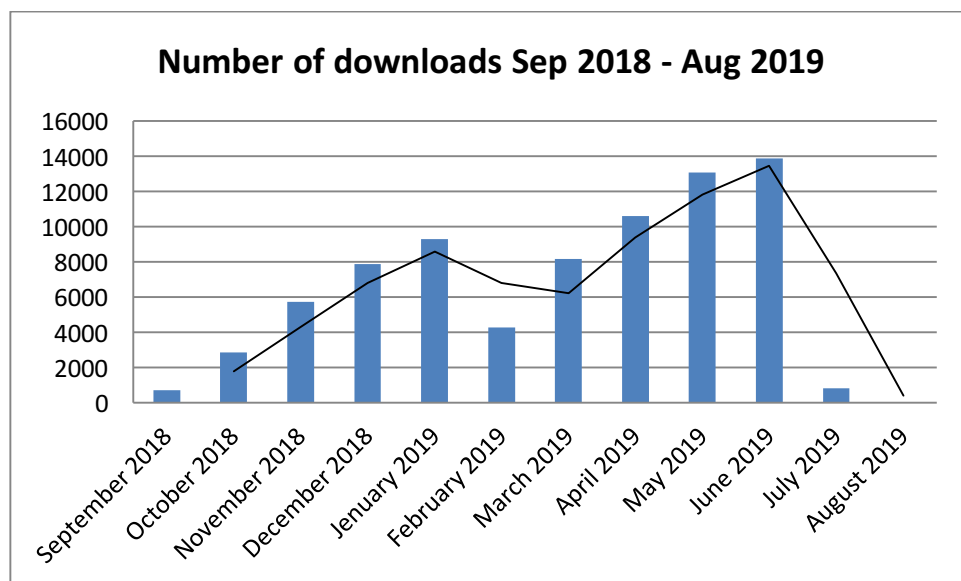


Graphic 23. Total downloads between march 2020 and February 2021. Source: own elaboration

#### 8.5.1.2. Optimistic Scenario

The same procedure is going to be done now for the t scenario. In this case, from the total of possible potential clients, it is estimated that during the first year, 30% of them are going to download the app. As it has already been said, during the first months of the application launch, the downloads are not going to be very big, on one side because a lot of people are not aware of the application existence, and on the other, BibApp will start implementing its service in universities libraries first, so the possible users are not as much as calculated before, during the first months.

The estimated downloads for the first year are shown in the graphic below:

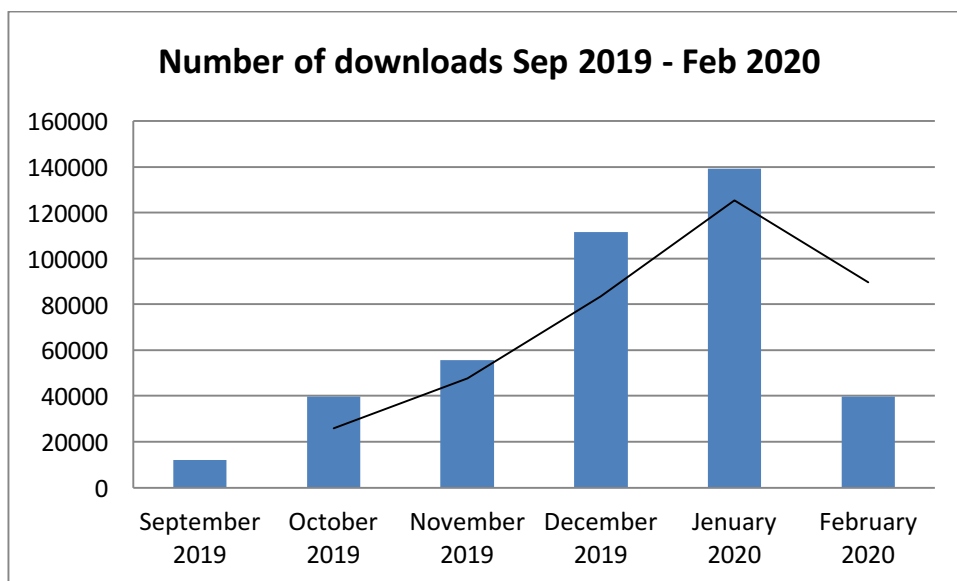


Graphic 24. Number of downloads between September 2018 and august 2019, optimistic scenario. Source: own elaboration

Again, the tendency of the graphic it can be explained with what it is said in the first graphic of the average scenario study. At first the app is not known, so downloads are not high, and during exams periods this number become higher, being very low in periods without a lot of exams.

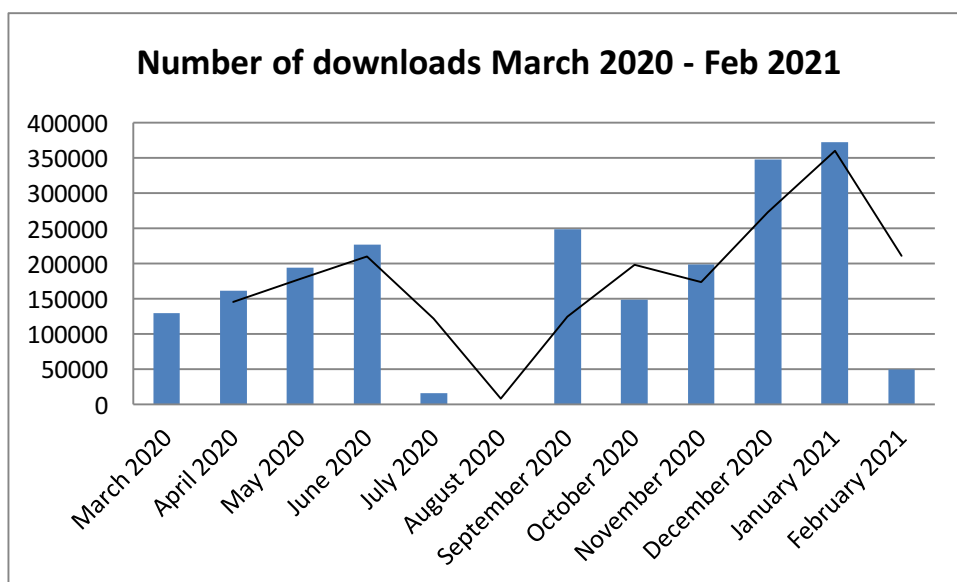
The expected gathered downloads for the following 6 months is a total of 100% of the total potential clients, being an 83% of the whole number of students calculated before. In the graphic below it is shown the number of downloads per month during the second year and following the same tendency explained before:





Graphic 25. Number of downloads between September 2019 and February 2020. Source: own elaboration

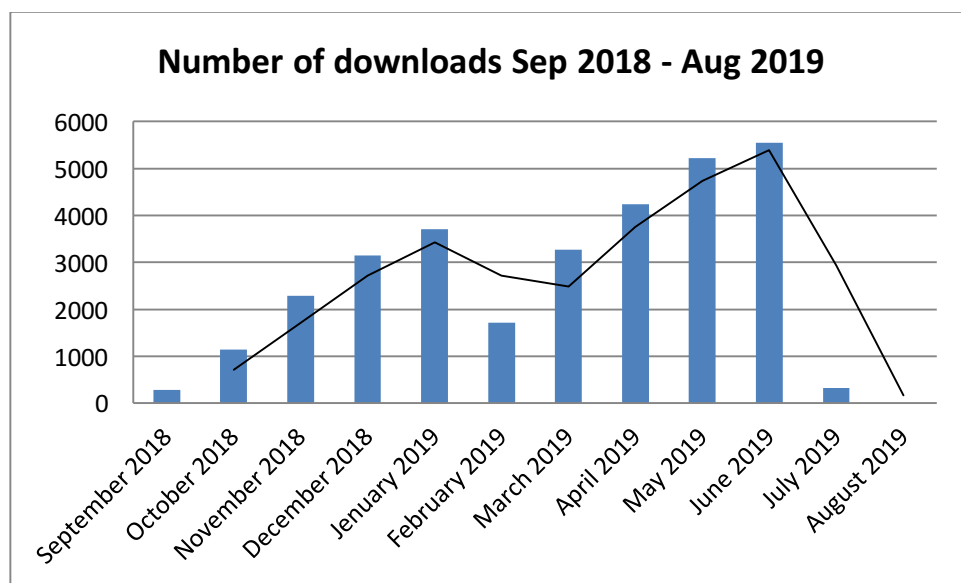
Finally, following the same procedure as the average case is going to be estimated the number downloads for the following year from March 2020 to February 2021, considering a 100% of downloads from the 83% of interested clients:



Graphic 26. Number of downloads between march 2020 and February 2021, optimistic scenario. Source: own elaboration

### 8.5.1.3. Pessimistic Scenario

Finally, a study with a worst scenario is studied. It has been followed the same structure as before for estimating the number of downloads. During the first year, BibApp would only have a 12% of downloads from the 83% of potential clients. The total numbers of downloads per month are shown below:

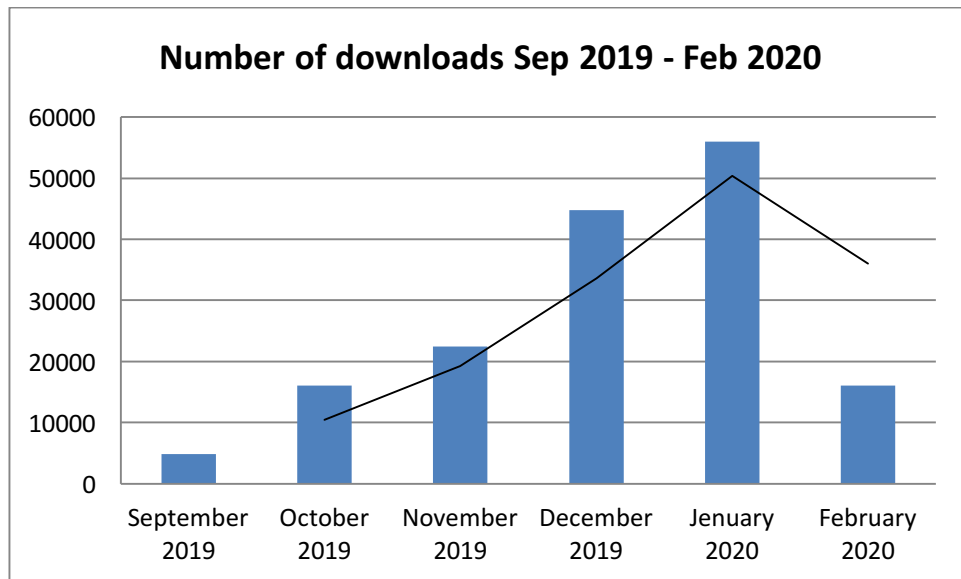


Graphic 27. Number of downloads between September 2018 and august 2019, pessimistic scenario. Source: own elaboration

For the following 6 months it is estimated that the percentage of downloads that BibApp will have gathered with the first year is a 40% from the 83% of people willing to download the app. With this percentage, the number of downloads are the following:

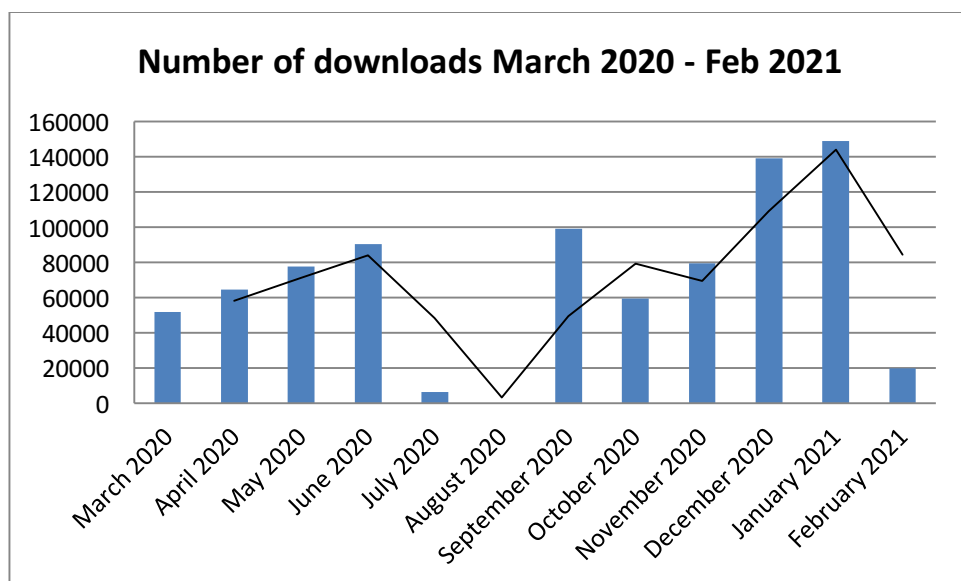






Graphic 28. Number of downloads between September 2019 and February 2020, pessimistic scenario. Source: own elaboration

Finally, the total approximately estimated downloads for the following year, considering that BibApp will only have a 40% of the 83% of potential downloads are:



Graphic 29. Number of downloads between march 2020 and February 2021,, pessimistic scenario. Source: own elaboration

### 8.5.2. Downloads forecast for March 2021 to February 2022

During this year, BibApp will expand its service to the most important university libraries of Portugal, France and Germany.

There are a total of 6 libraries in Portugal, 22 libraries in France and 24 in Germany. So BibApp will be expanding to 52 more libraries<sup>15</sup> in the third year in 3 different countries. It has been decided to implement the service in these libraries because they are the most important universities of each country.<sup>16</sup>

As BibApp will not reach to every university of each country it has been considered that the number of total students that BibApp is going to reached is not the same number of the total of university students on every country. It has been considered that BibApp will approximately reach a 30% of the total number of students.

Number of students in Portugal

Students type	Number of students
Higher Level Training Cycle	400
University	203.800
Master	114000
PhD	19.300
<b>Total</b>	<b>337.500</b>

Table 13. Number of students in Portugal. Source: own elaboration

<sup>15</sup> See appendix page 72-73

<sup>16</sup> [https://biblioteca.ugr.es/pages/biblioteca\\_electronica/guias\\_tematicas/catalogos\\_otras\\_bibliotecas/blunieurop](https://biblioteca.ugr.es/pages/biblioteca_electronica/guias_tematicas/catalogos_otras_bibliotecas/blunieurop)



Students in France:

Students type	Number of students
Higher Level Training Cycle	495.500
University	991.200
Master	868900
PhD	68.600
<b>Total</b>	<b>2.424.200</b>

Table14. Number of students in France. Source: own elaboration

Number of students in Germany:

Students type	Number of students
Higher Level Training Cycle	400
University	1.792.400
Master	988.800
PhD	196.200
<b>Total</b>	<b>2.977.800</b>

Table 15. Number of students in Germany. Source: own elaboration

Total Students in the 3 countries:

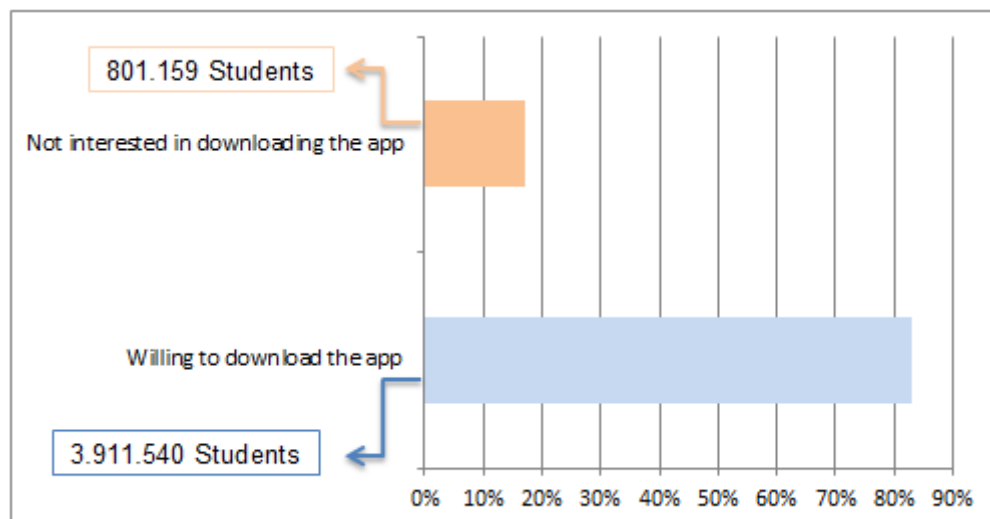
Country	Number of students
Portugal	337.500
France	2.424.200
Germany	2.977.800
<b>Total</b>	<b>5.739.500</b>

Table 16. Number of students in Portugal, France and Germany. Source: own elaboration

As it has already been said, from this total BibApp will reach a 30%:

$$5.739.500 \text{ students} \times 0.3 = 1.721.850$$

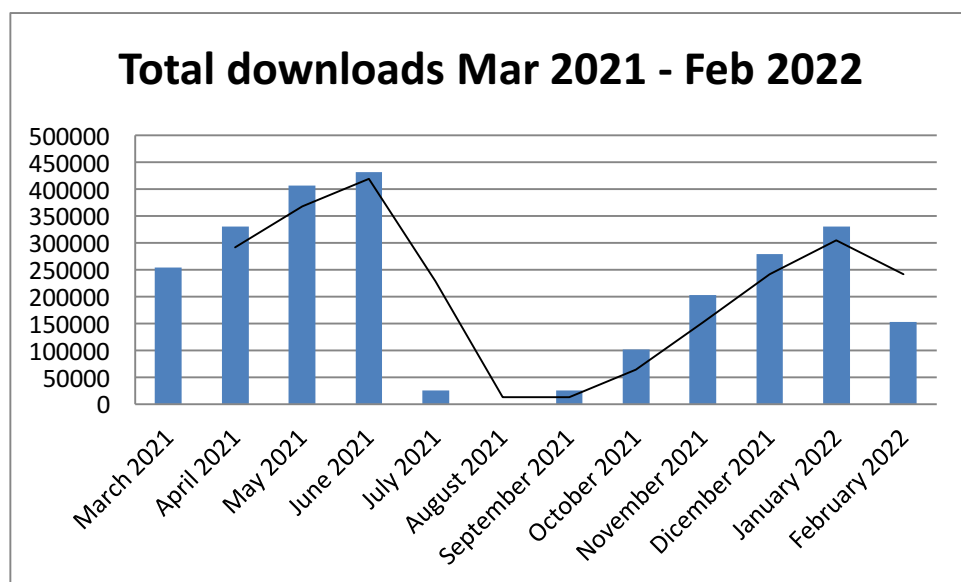
Following the same procedure as the years before is it going to be estimated that from the total number of potential users, only 83% will be willing to download the app:



Graphic 30. Students willing to download the app. Source: own elaboration

### 8.5.2.1. Average Scenario

For estimating the total of downloads as it has been done before is it going to be considered that 65% or the total number of potential users is going to download the app:

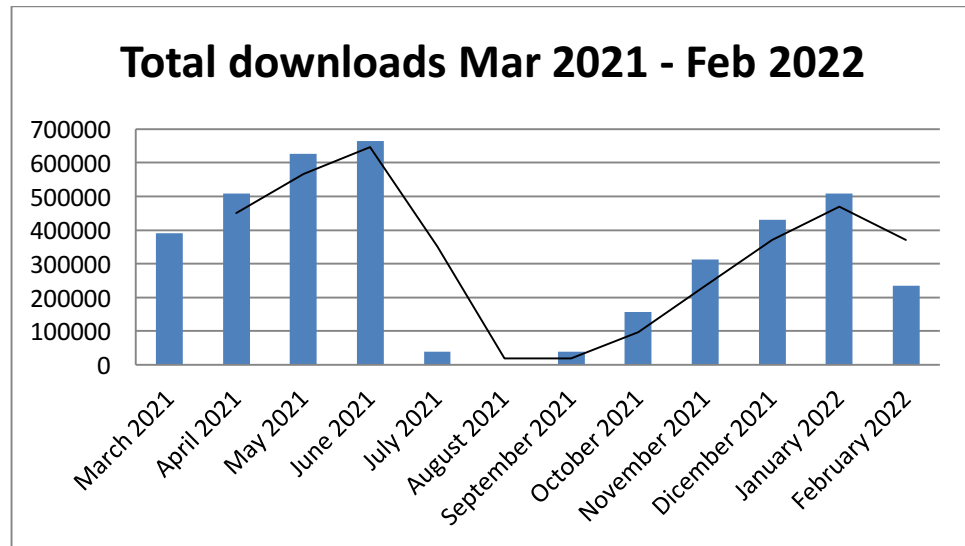


Graphic 31. Total downloads between march 2021 and February 2022, average scenario. Source: own elaboration



### 8.5.2.2. Optimistic Scenario

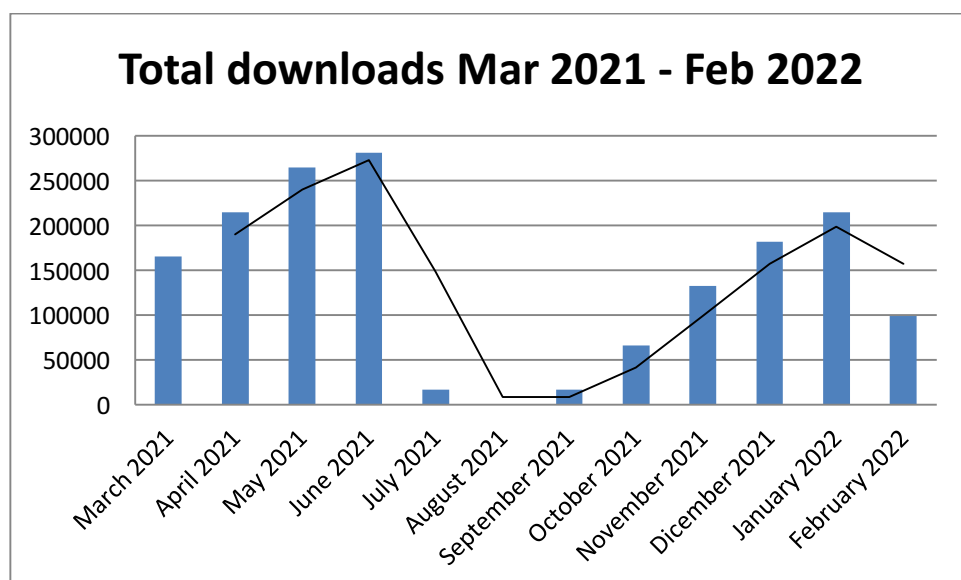
For estimating the total of downloads in an optimistic case, it is going to be considered that the total number of potential clients are going to download the app, that is to say, 83% of the total number of students:



Graphic 32. Total downloads between march 2021 and February 2022, optimistic scenario. Source: own elaboration

### 8.5.2.3. Pessimistic Scenario

Finally, the same study is going to be done but considering a pessimistic situation where just 40% of the total potential clients are going to download the app:



Graphic 33. Total downloads between march 2021 and February 2022, pessimistic scenario. Source: own elaboration

### 8.5.3. Downloads forecast for March 2022 to February 2023

The expectation expands of BibApp for this year is through university libraries in the countries of Italy, Belgium and Holland.

There are a total of 53 libraries in Italy, 5 libraries in Belgium and 9 libraries in Holland. So the expansion of BibApp for the fourth year is to 67 most important libraries<sup>17</sup> in three more different countries.<sup>18</sup>

Also, as it has been done above in the forecast of downloads for the year before, now is going to be estimated the total number of users that BibApp will have in Italy, Belgium and Netherland.

<sup>17</sup> See appendix page 74-76

<sup>18</sup> [https://biblioteca.ugr.es/pages/biblioteca\\_electronica/guias\\_tematicas/catalogos\\_otras\\_bibliotecas/blunieurop](https://biblioteca.ugr.es/pages/biblioteca_electronica/guias_tematicas/catalogos_otras_bibliotecas/blunieurop)



Italy:

Students type	Number of students
Higher Level Training Cycle	6500
University	1.076.700
Master	710500
PhD	32.800
<b>Total</b>	<b>1.826.500</b>

Table 17. Number of students in Italy. Source: own elaboration

Belgium:

Students type	Number of students
Higher Level Training Cycle	24.400
University	365.900
Master	97.900
PhD	16.500
<b>Total</b>	<b>504.700</b>

Table 18. Number of students in Belgium. Source: own elaboration

Netherlands:

Students type	Number of students
Higher Level Training Cycle	18.700
University	646.900
Master	162.600
PhD	14.500
<b>Total</b>	<b>842.700</b>

Table 19. Number of students in Netherlands. Source: own elaboration

Total of students in the 3 countries:

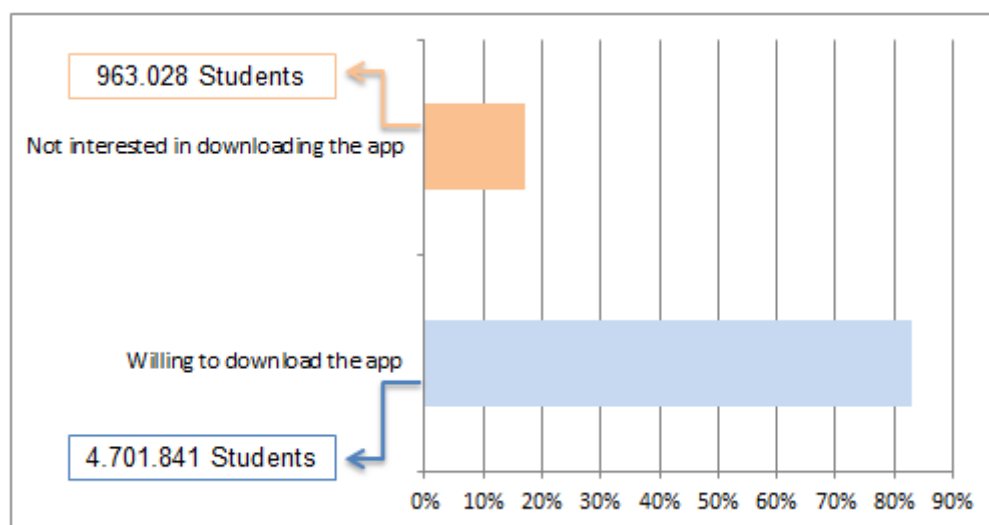
Country	Number of students
Italy	1.826.500
Belgium	504.700
Netherlands	842.700
<b>Total</b>	<b>3.173.900</b>

Table 20. Number of students in Italy, Belgium and Netherlands. Source: own elaboration

Number of students that BibApp will reach from this total:

$$3.173.900 \text{ students} \times 0.3 = 952.170 \text{ Students}$$

Knowing these numbers, it can now be estimated to total potential users of downloading the app during the fifth year:



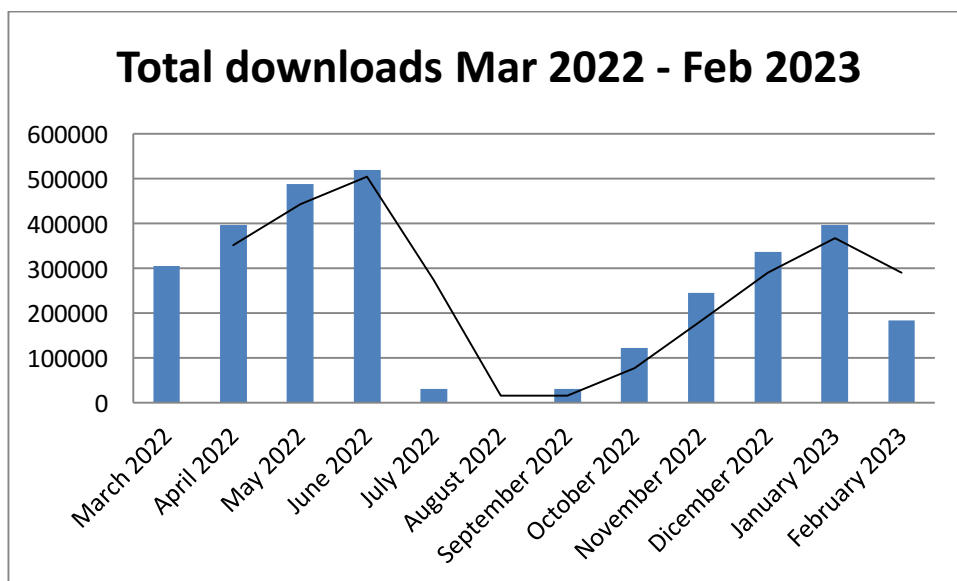
Graphic 34. Students willing to download the app. Source: own elaboration

### 8.5.3.1. Average Scenario

Repeating the procedure made before, for analyzing the estimated number of downloads for the fourth year of BibApp is going to be considered that 65% of the potential clients will download the app:



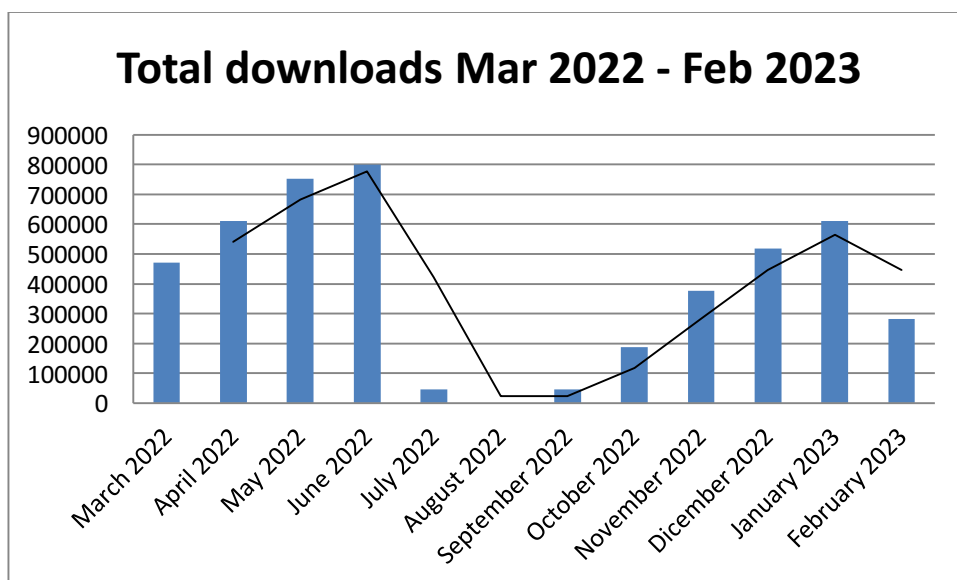




Graphic 35. Total downloads between march 2022 and February 2023, average scenario. Source: own elaboration

#### 8.5.3.2. Optimistic Scenario

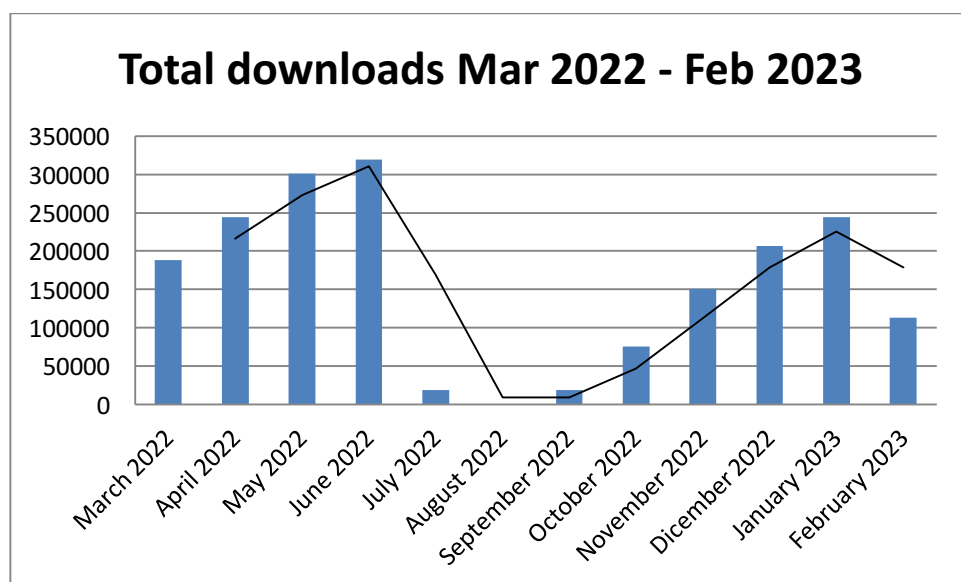
Considering that all 83% of potential users will download the app the number of estimated downloads is:



Graphic 36. Total downloads between march 2022 and February 2023, optimistic scenario. Source: own elaboration

### 8.5.3.3. Pessimistic Scenario

Replicating the procedure, the estimated number of total downloads when considering a 40% of downloads is:



Graphic 37. Total downloads between march 2022 and February 2023, pessimistic scenario. Source: own elaboration

### 8.5.4. Downloads forecast for March 2023 to February 2024

For this year, is expected to expand into the university libraries from countries on the north: Denmark, Finland, Norway and Sweden.

There are a total of 10 libraries in Denmark, 6 libraries in Finland, 4 in Norway and 13 in Sweden. For a total of 33 university libraries in 4 countries<sup>19</sup>. The most important ones.<sup>20</sup>

Is it now going to be estimated the number of potential users for the sixth year. BibApp will expand to 4 more countries in Europe:

<sup>19</sup> See appendix page 76-77

<sup>20</sup> [https://biblioteca.ugr.es/pages/biblioteca\\_electronica/guias\\_tematicas/catalogos\\_otras\\_bibliotecas/blunieurop](https://biblioteca.ugr.es/pages/biblioteca_electronica/guias_tematicas/catalogos_otras_bibliotecas/blunieurop)



Denmark:

Students type	Number of students
Higher Level Training Cycle	35.000
University	195.100
Master	73.800
PhD	9.900
<b>Total</b>	<b>313.800</b>

Table 21. Number of students in Denmark. Source: own elaboration

Finland:

Students type	Number of students
Higher Level Training Cycle	-
University	219.400
Master	63.200
PhD	19.900
<b>Total</b>	<b>302.500</b>

Table 22. Number of students in Finland. Source: own elaboration

Norway:

Students type	Number of students
Higher Level Training Cycle	9.800
University	188.800
Master	62.100
PhD	7.500
<b>Total</b>	<b>268.200</b>

Table 23. Number of students in Norway. Source: own elaboration

Sweden:

Students type	Number of students
Higher Level Training Cycle	25.200
University	246.400
Master	135.600
PhD	21.400
<b>Total</b>	<b>428.600</b>

Table 24. Number of students in Sweden. Source: own elaboration

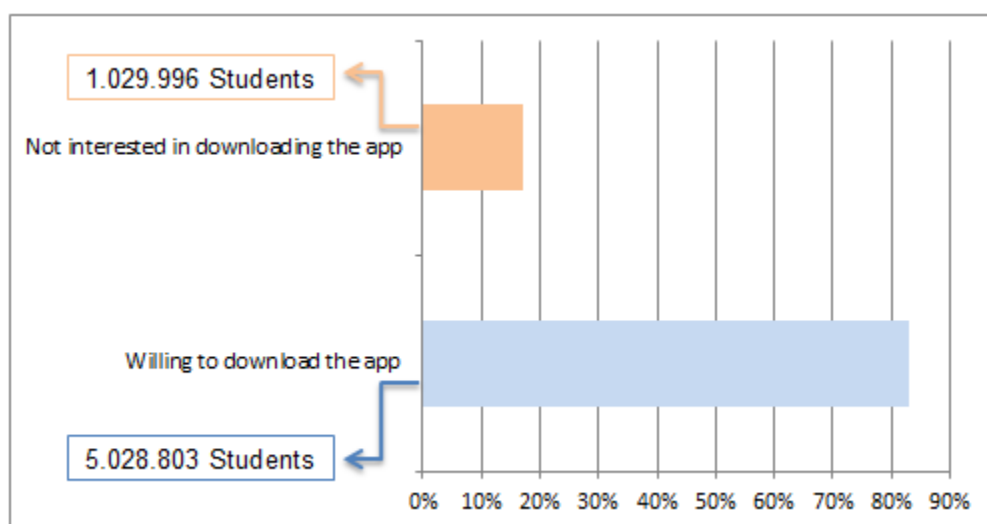
Total of students in the 4 new countries:

Country	Number of students
Denmark	313.800
Finland	302.500
Norway	268.200
Sweden	428.600
<b>Total</b>	<b>1.313.100</b>

Table 25. Number of students in Denmark, Finland, Norway and Sweden. Source: own elaboration

$$1.313.100 \text{ students} \times 0.3 = 393.930 \text{ students}$$

Finally, the total number of potential users of BibApp for the fifth year is:

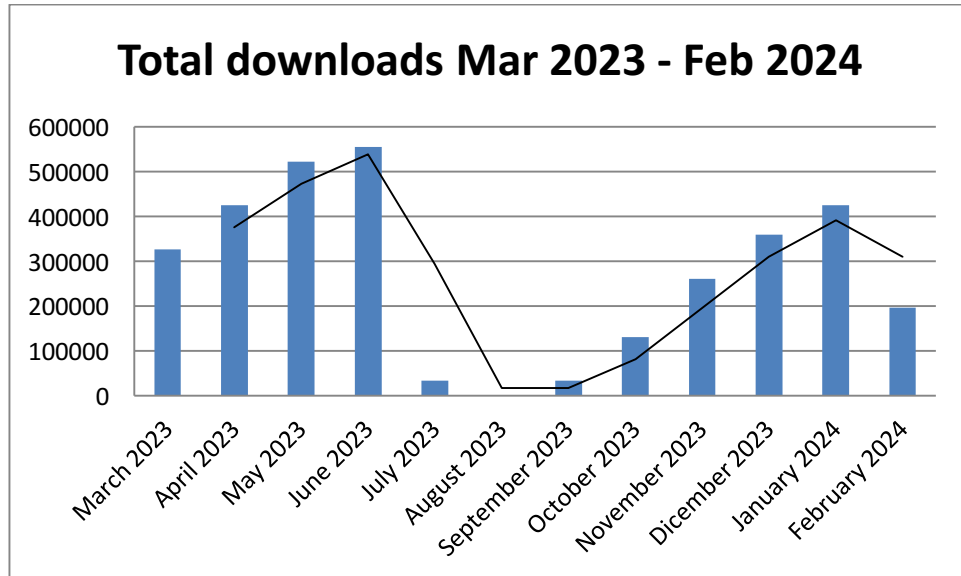


Graphic 38. Students willing to download the app. Source: own elaboration

#### 8.5.4.1. Average Scenario

The number of downloads for month considering that BibApp achieves a 65% of total downloads:

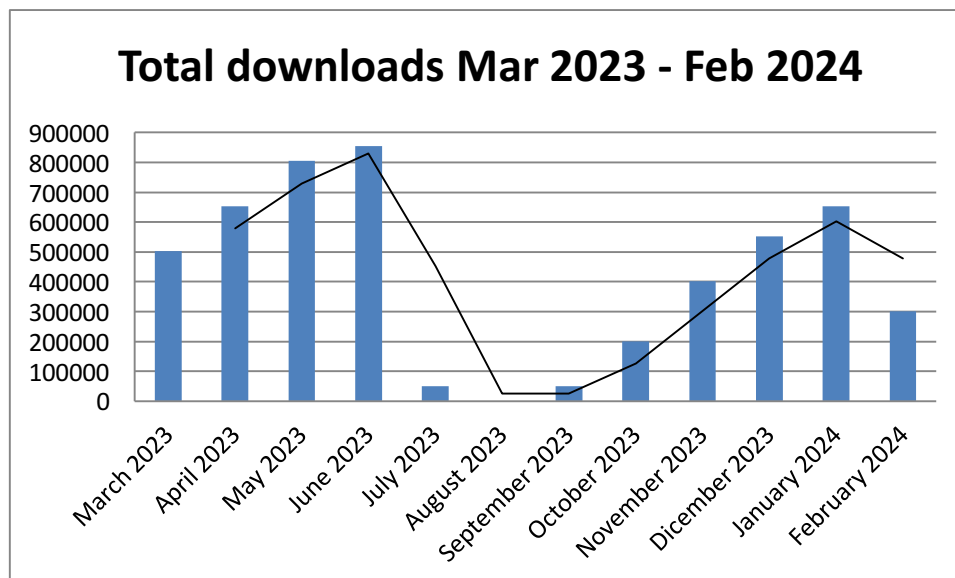




Graphic 39. Total downloads between march 2023 and February 2024, average scenario. Source: own elaboration

#### 8.5.4.2. Optimistic Scenario

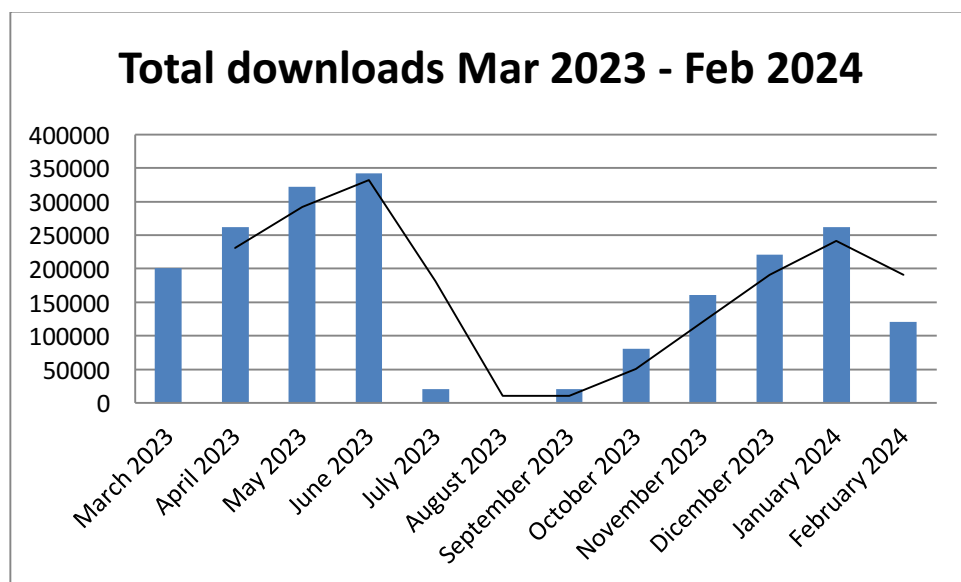
Considering that BibApp obtains the total 83% of potential users the total downloads per month will be:



Graphic 40. Total downloads between march 2023 and February 2024, optimistic scenario. Source: own elaboration

### 8.5.4.3. Pessimistic Scenario

Finally, a pessimist case is going to be studied considering a 40% of the total potential users:



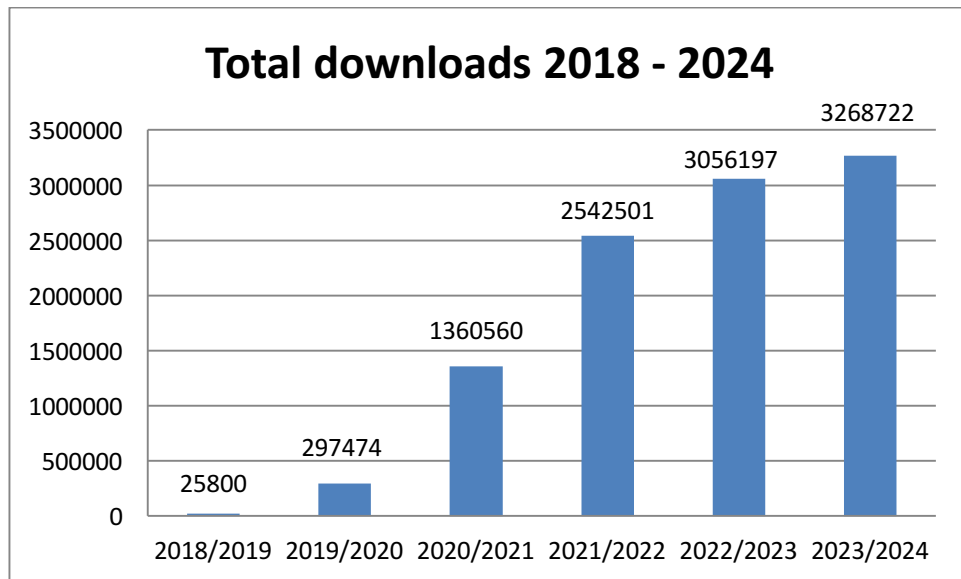
Graphic 41. Total downloads between march 2023 and February 2024, pessimistic scenario. Source: own elaboration

### 8.5.5. Downloads forecast for the first 6 years:

#### 8.5.5.1. Average Scenario

The study of the totals downloads that BibApp will have has done considering that BibApp will obtain a 65% of the total potential clients during the 6 first years, except for the first year that as BibApp will be known by not a lot of people, it has been decided to estimate the number of downloads to a 25% of the 83% of potential users:

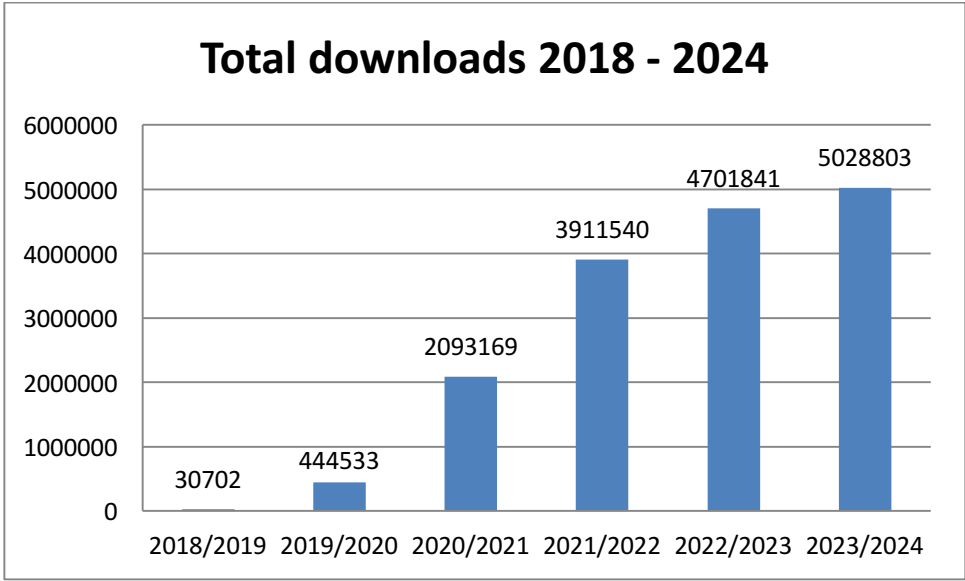




Graphic 42. Total downloads between 2018 and 2024, average scenario. Source: own elaboration

#### 8.5.5.2. Optimistic Scenario

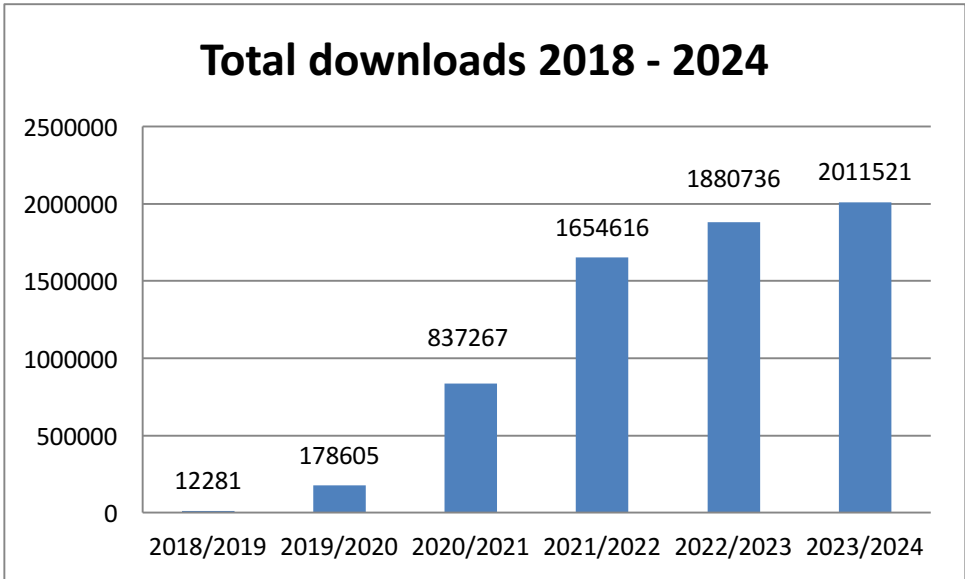
For analyzing the total number of downloads in an optimistic scenario, it has been considered that the totality of 83% of potential users will download the app. Doing this analysis the total number of downloads per year is:



Graphic 43. Total downloads between 2018 and 2024, optimistic scenario. Source: own elaboration

8.5.5.3. Pessimistic scenario

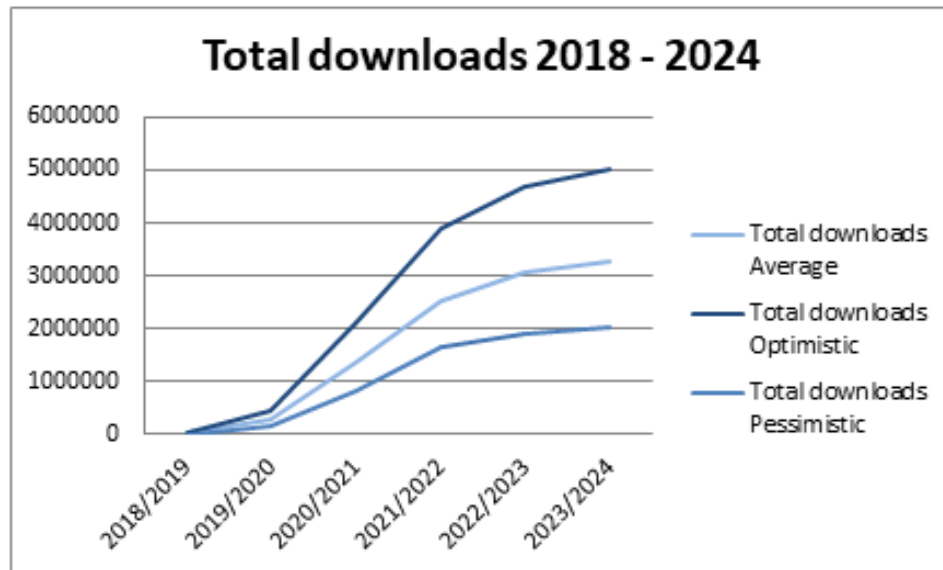
Finally, a last scenario is going to be studied, a pessimistic one. It is going to be estimated that just 40% of the total potential users are going to download the app. The total downloads distributed by years are:



Graphic 44. Total downloads between 2018 and 2024, optimistic scenario. Source: own elaboration







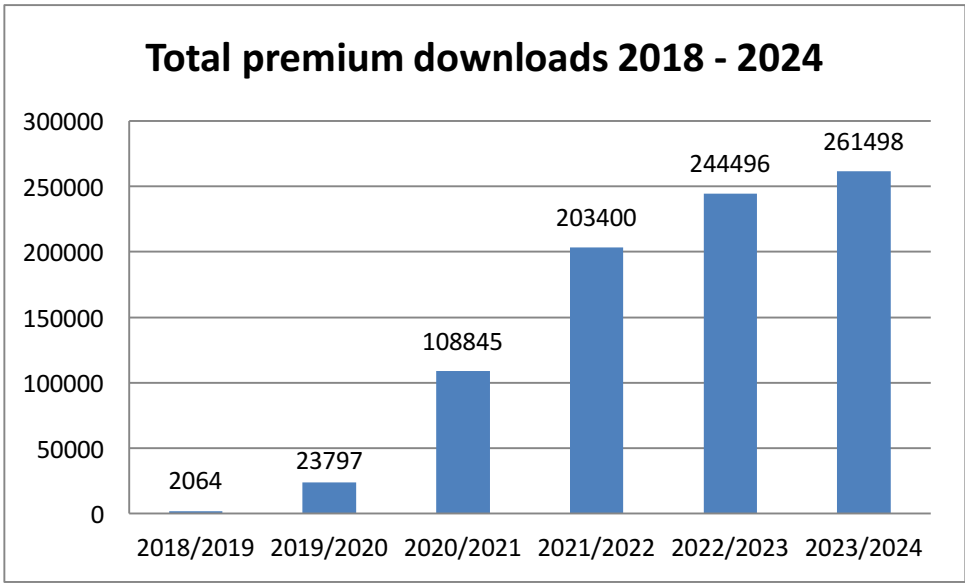
Graphic 45. Total downloads between 2018 and 2024, comparing the three scenarios. Source: own elaboration

## 8.6. Premium Downloads

From the study made before it can be now estimated the number of premium downloads that BibApp will have. Is it also going to be studies the number of premium downloads in an average, optimistic and pessimistic case.

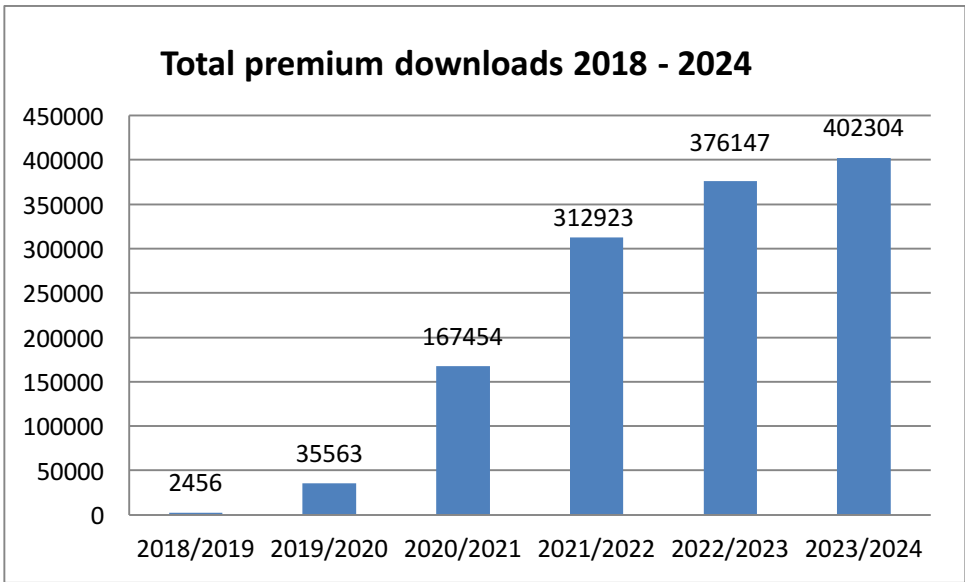
It is estimated that the number of premium downloads is 8 per every 100 downloads. Knowing this and having the estimated number of downloads during the first sixth years, it can be now estimated the premium downloads in three different scenarios:

8.6.1. Average Scenario



Graphic 46. Total premium downloads between 2018 and 2024, average scenario. Source: own elaboration

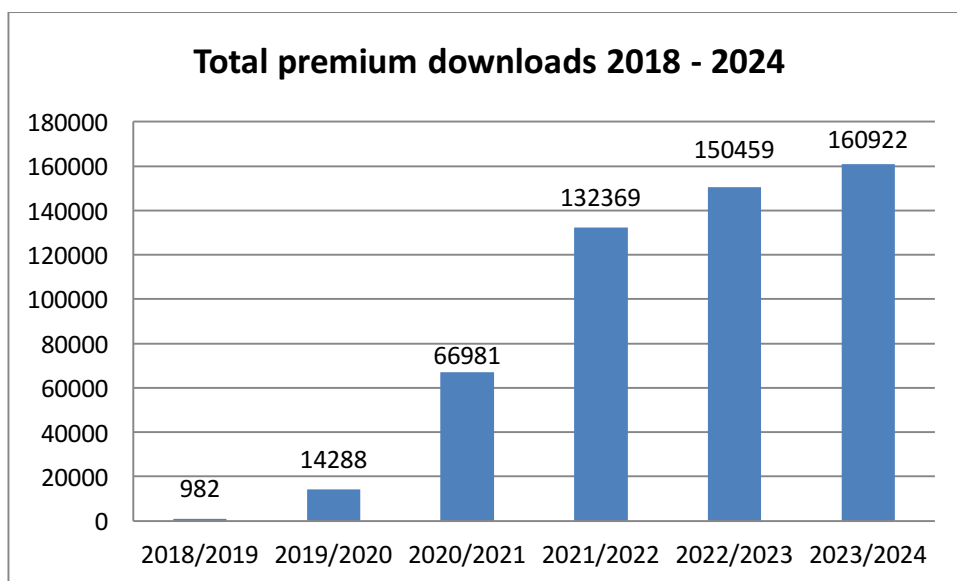
8.6.2. Optimistic Scenario



Graphic 47. Total premium downloads between 2018 and 2024, optimistic scenario. Source: own elaboration



### 8.6.3. Pessimistic Scenario



Graphic 48. Total premium downloads between 2018 and 2024, pessimistic scenario. Source: own elaboration

For more detail see appendix page 33-43.



## 9. Human Resources Plan

Every business, without mattering the size, sector, etc. in order to work and operate properly need an organizational structure. If an enterprise does not have an organizational structure, can very easily have problems at the time of implementing company policies and having and doing an efficient work. Also, a business with a good organized structure will lead to a company with a high productivity.

An appropriate organization of a business allows to the tasks in the correct way, minimizing expenses, avoiding slowness or the need of double efforts for determining the responsibilities of the workers. A proper business organization conducts to an essential part to persuade success in any business management.

In order to achieve that our business is a successful enterprise, it is key to know what involve each work station of the enterprise, which are the responsibilities of every worker. Each person is hired for doing specific duties, and each work occupies a different position on the company organization chart. Differentiating its position will also lead to success.

Goals that company organization pursue:

- Effectiveness: achieve proposed goals of the business, achieving gaining and surpluses.
- Efficiency: it consists on the optimized utilization of the available resources, whether economics, materials or humans, in order to achieve with effectiveness, the business objectives with the lowest possible cost and time.
- Efficacy: capability of the entity to answer in a quick and appropriate way to situations that produce in a specific moment and fulfill the goals and satisfy the client's or users' needs.

Effectiveness is to reach the goals and if that is done with efficiency, using resources in an optimum way, it will have been efficacy. Efficacy is the sum of effectiveness and efficiency under a synergy concept.

- Obtaining productivity
- Achieve profitability
- Get quality
- Accomplish market growth
- Being able to provide a good working atmosphere

In terms of management, the company needs someone who is able to run the business effectively, the CEO (Chief Executive Officer).

The CEO is the highest ranking executive in a company and is the person that has the maximum responsibility. In order to acquire resource inputs, managers use their decision making authority. And then resource inputs are used to produce goods and services that customers need. Doing this, earns a profit for the business and its shareholders. A few tasks that CEO's usually do are:

- Establish strategy and direction
- Modeling and implementing the company's culture, as well as, values and behavior
- Building and leading the senior executive team
- Allocating capital to the company's priorities



## 9.1. Company Organizational Plan

The company will be divided into 3 different departments, which will be under the supervision of the CEO:



Image 39: BibApp organizational chart. Source: own elaboration

The marketing department: The marketing is believed to be only related with the promotion and publicity of a company, actually, promotion and publicity are just two of the many aspects that marketing covers.

Marketing is the set of activities that allows a company to find a market to address to and attend it in the best possible way. Some examples of these activities are de search of business opportunities, consumer's analysis, competition analysis, products design, products promotion and products distribution.

The marketing department is who is responsible for investigating, developing and implementing the strategies needed to achieve the goals of a company. It is their job to find out information about the target users and competition to help reaching as many customers as possible. Also, is in charge of advertising the products and services of a company in order to promote the company. Is in charge of planning the marketing strategy, how to make the

company known by choosing the media channels for advertising BibApp, such as social media, websites, etc. They usually use surveys and other tools to help to uncover information and statistic or use publications.

As we offer a unique product in the market, the marketing department task is crucial in order to make BibApp reach as many people as possible.

The Finance Department this department is a key element for the development and sustainability of any business. The success of a company mostly depends on how well the finance is handled. It is the finance department job to obtain financing for the company, also managing and planning the investments of the business. To support all business activities, the financial department takes care of the necessary financial control and the effectiveness of the financial management.

Some roles, responsibilities and task that the financial department is responsible for are:

1. Accounting operations recording and financial data: with the aim of obtaining the actual and historical information of the business for planning and making appropriate decisions.
2. Plan, analyze and evaluate the registered information. For doing this, it is necessary to know deeply the business situation through budgeting, flow of funds, indicators and cost analysis. From a proper planning, it is possible to establish future goals, payments strategy, receipts and investments seeking growth and a greater profitability of the business, anticipate deviations and anticipating unfavorable situations.
3. Look for financing sources and select the most convenient for the entrepreneurship. There are many different financing options and each company needs to analyze which adapts better to its necessities. Such as seed capital, business angels or bank loans.
4. Looking for the best investing option that the business can count on, and select the one that the profitability complies with the achieved financial capacity.





5. Control of the executed operations and registered with the aim of, if it is necessary, rectify errors or omissions for the subsequent analysis of deviations in relation to the initial budget developments, seeking the most efficiency possible.
6. Bookkeeping: this consists on the daily recording, interpretation and analysis of a business financial transaction. Monitoring expenses, sales, etc.
7. Advising and sourcing longer term financing. The financial department is responsible for advising a company on the best financing option that could improve the company's efficiency and achieve the best profit.
8. Management of Taxes. Handling the taxes that every business must pay is the liability of the financial department.
9. Assist managers in making key strategic decisions. It is duty of the financial department to advice the company's management when making strategic decisions by sharing information such as payback periods of large capital purchases, counsel about the most potential markets or projects, etc.

The Research and Development Department is in charge of assuring the efficiency of the interface, that the app and the web site works without setbacks, generating and efficient execution, specify, integral and with reliable shared data and information.

Generate proposals of modernization of the interface of BibApp for assuring continuous updates and capture business opportunities that present the innovation in informatics subjects.

Also, ensure a correct utilization of the computer systems which the enterprise counts with. When a mistake arises in TIC, this department is responsible for implementing a backup plan.

Furthermore, take part in the technical assessment of the investment projects in technology of information and communication, contributing backgrounds for its economics evaluation.

## 9.2. Number of Employees

At the beginning, the company will count with 2 employees. Both of them will be funding partners and will act like CEO's, they will always be the person with the highest responsibilities of the company. They will take care of hiring all freelancers needed for developing the website and the app, also attorneys and a notary for launching the business, marketing campaigns in order to make the app known by as much people as possible and also responsible for the sales of the firm.

The company organization will be amended as the business expands, or workload increases. The idea is to in the following months more or less a year, hiring a person responsible for the development of updates for the app and another one for taking care of all the related things about marketing.

Department	Function	2018	2019	2020	2021	2022	2023
Management	CEO	2	1	1	1	1	1
	CFO	0	0.5	0.5	0.5	0.5	0.5
	CTO	0	1	1	1	1	1
	CMO	0	0.5	0.5	0.5	0.5	0.5
Finances and Sales	Financial employee	0	0	0	0	1	1
Marketing	Marketing	0	0	0	1	1	1
R&D	Programmers and Designers	0	0	1	1	1	1
<b>TOTAL</b>		<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>6</b>

Table 26. Number of employees of the company.

As it can be seen in the table above, since the beginning will be two persons responsible for the management of the whole company responsible for the finances, marketing, sales, etc. Both partners will work the whole labor journey<sup>21</sup>.

The second year the team is expected to grow, hiring 1 more people. It is decided to hire a Chief Technology Officer for taking care of the design and updates of the application. The contract of this new person will be a full time contract.<sup>1</sup>

1 of the partners will be the Chief Marketing Officer because in the beginning, one of the most important things is attracting people to use BibApp and reach as many people as

<sup>21</sup> See appendix pages 28-32

possible. The other partner will take care of the finances of the company. Both will continue also as CEO of BibApp. This is why it is registered as 0.5 each.

For the following year, 1 more people is going to be hired, as the company is expected to grow exponentially, it will be needed a person responsible for helping the CTO with the unforeseen wrinkles, design and expansion of the app. The intern from the research and development team will have either a full time contract or part time.<sup>22</sup>

The fourth year, another intern will be hired for the marketing team, as it has already been said; BibApp tries to expand quickly to other countries, for this reason, it is important to carry out a powerful marketing campaign. Also this intern will have either full or part time contract.

Finally, in 2022 and for the following years, one last member will be hired, an employee in charge of helping in the finances of the company. This new member of the team will sign up for a full time contract<sup>2</sup>.

As for the moment, the company is not going to have a lot of employees; it is decided not to hire any person responsible for human resources, until the business grows more.

Always the possibility of opening new workstations is considered as the company grows and more people are needed to achieve all goals of the company.

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<sup>22</sup> See appendix pages 28-32

### 9.3. Responsibilities and aptitudes that employees must have

Charge	Responsibilities	Qualifications Required
Chief Executive Officer (CEO)	In charge of running the company; making decisions and managing the organization.	Industrial Engineering Degree and a Master's in Business Administration
Chief Financial Officer (CFO)	Is in charge of the company's economic and financial planning. Is the person that decides the investment, funding and risk with the purpose of raising the company's value.	Economics and Law knowledge
Chief Technology Officer (CTO)	Develop the app and take care of its maintenance. Responsible for improving the app over time and fixing all technology issues.	Computer Engineering Degree
Chief Marketing Officer (CMO)	Plan and perform the marketing strategy. In charge of promoting the company by advertising BibApp	Marketing Degree
Financial Employee	Manages the budget of the company and accountancy. Helps the CFO	Economics Degree
Marketing Intern	Helps the CMO	Currently studying Marketing
R&D Intern	Helps the CTO. Testing of the app and website	Currently studying Computer Engineering

Table 27. Responsibilities and aptitudes of the employees.



It is necessary that all employees, except for the interns, have completed their university studies. These university studies must be related with their position in BibApp. For being the chief of a department no masters is necessary needed, but having one, will increase the possibilities of getting the job.

Another thing that will be taken into account when hiring someone, it will be their work experience. As more experience the candidate has, more possibilities of being hired.

## 9.4. Paying Structure

When starting a new business is often very difficult to pay employees. It is necessary more revenue to hire employees but for obtaining more revenue, more employees are needed. For resolving these problems, there are a lot of alternatives that new and small business owners can follow in order to justly compensate employees but not draining cash reserves:

- Offer Competitive Stock Options

Competitive stock is a very used method for paying employees. It is possible to draw the best talent when not being possible to pay a large salary. This alternative can only be used for startups that have investors. This method can only be used to pay off workers when it exists a realistic track to cashing out. Thus, BibApp is the kind of business that can use this paying structure because offering stock options usually makes sense only if the company is backed by outside investors and is likely to go public or be bought by another company.

Offering equity can be an alternative to attract the best employees when it is not possible to pay a large salary. When starting a new business, the first hired employees must be people that truly believe in the service or product that the company is selling, that the company has real value. These first employees must be also passionate and willing to take risks. Normally, workers that are willing to accept this way of paying, offer competitive stock options, are more likely to be people that work a lot and are really motivated with their jobs. This type of employees is what new and small business need at the beginning in order to grow.

“Stock options tend to motivate employees more than cash bonuses at the startup stage,” says Covestor CEO and CircleLending founder Asheesh Advani. In order to incentive employees to invest more time and energy in their work at the company, it is a very good option to reward hard work with equity.

- Hire Interns

There are a lot of talented students that are willing to get a valuable work experience in exchange for no or very little salary. There are only going to be interested on doing this if the job that is offered is a real and valuable work.

For finding these students' enterprises must contact career offices of local colleges or universities for posting an announcement that an intern is needed in order to see if any of the possible applicants for the job is really a good candidate that can offer a good job and help to grow the startup.

However, this interns that are going to be paid very little or anything, depending on the case, are going to want to work if they are offered a job that allows them to advance and grow in the careers. It is important to keep contact with them, make regularly meetings to make sure that they are getting the intern that they were desired, that their goals are fulfilled with the realization of this internship program.

However, unpaid interns will only work for you if they are getting the opportunities they need to advance their careers. Meet regularly with them to make sure they feel taken care of and are getting the experience and mentorship they desire.

- Defer Compensation

Another way to save money when a business is started is to defer paying workers until specific and agreed established milestones are achieved. This can be in the form of cash bonuses or back-pay that until the company earns a certain amount of revenue or profit, is not disbursed. In order to keep employees motivated it is a good idea to tie salary payments and raises to specific efficiency successes.

If this option is chosen, is important to hire an attorney as a consultant to write the employee offer letter. Because, when using terms that are not correct in the employment contract could cause costing more money to the business, instead of saving it.



## 9.5. Recruiting Plan

In order to find new employees as the company grows different ways will be used:

- University forums and contact the university's career office

University Forums are business events hold in universities that normally are organized by students and it is specially aimed to students that are finishing their studies. The goals in to bring over and facilitate students, to enter the working world. The main objective is to simplify student-business connection.

In University Forums, companies are offered the possibility to assist to universities with a stand to improve student's awareness of their business.

Contact the career development offices for colleges and find out whether they offer internships for credit; what they need to add your company to their database; and the best way to get your openings in front of students. If the first batch of interns has a good experience, universities will usually send you a steady stream of top applicants with little additional effort on your part.

- Social Media

LinkedIn is the largest professional network in the world used to be promoted, make networking and business. LinkedIn is a professional tool that allows finding candidates for working.

There a few more social networks that are used in order to find employees: Infojobs, Bewanted, Indeed...

- Use our website

In the BibApp website a careers page will be created. It will be located in an easy-to-find tab or link of the homepage and it will be filled with everything a job-seeker might need, describing carefully all the aptitudes and requirements needed for the offered position and also what it is offered in the job position.





## 10. Operational Plan

### 10.1. Location

The location for the first two years will be in a coworking space. Coworking is a custom that spread very quickly between freelance in United States and that since a few years ago began to expand in Spain and Europe.

Coworking is the term whereby professionals that do not share either company neither sector nor activity, and come together for working in the same space. A coworking space is the perfect place to reduce the working loneliness and reduce the expenses invoices.

In coworking spaces the infrastructure is really good. It is possible to count with boardrooms and meeting rooms to receive clients. It is possible to relate with other professionals and share a coffee or a project.

It is decided to start BibApp in a coworking space located in Carrer de Calatrava, 1, 08017 Barcelona.

Once the business starts growing, it will be necessary to find a bigger and private location. For choosing the best location for the business a few parameters have been taking into account; such as enough space to establish, well communicated so employees do not have difficulties to access, a zone with a lot of restaurants and coffees for having breakfast and lunch, cost, utilities...

It is decided to choose an apartment for approximately 5 people that it is the forecast of employees for more or less two years ahead.

The rent location has the following characteristics:

- Size: 60 m<sup>2</sup>
- Zone: It is not necessary any special location, it is not needed proximity from customers to our location so it is decided to choose a neighborhood with a lot of facilities and inside our price range. A living place is found in Santaló Street, Sarrià, Sant Gervasi in Barcelona

- Accessibility: the building next to where the office is going to be located, counts with a public parking where lots can be rented if any employee need to come by car every day. Also, in front of the building there is a loading and unloading zone in case any supplier needs to make a delivery. Accessible by bus, lines: 6, 7, 27, 32, 33, 34, 41, 68, H8, L51 and D40. Tram: T1, T2, T3, Railway: L6.
- Neighborhood with full of restaurants and coffees that offered menus and breakfast discounts with very economical price.
- Cost: 600 €/ month
- Building infrastructure: the building is an old building but have the necessary infrastructures to support our needs, adequate electrical, air conditioning, telecommunication service and good service.
- Security: the neighborhood is very secure and full of people and there is lots of life.
- Potential for growth: the apartment from upstairs the one it is rented, is available. So it is a building able to accommodate business growth.

Moving premises is a big upheaval and can be time consuming and costly. Consequently, a location's flexibility is a very important factor regarding the premises suitability for the business needs due to the fact that BibApp is expected to increase its number of employees.

- Utilities: the apartment count with 1 big space of 35 m<sup>2</sup>, 1 room of 12 m<sup>2</sup> enough for being the CEO's office and another space to hold meetings and receiving clients of 10 m<sup>2</sup> with space and a small bathroom of 3 m<sup>2</sup>.

When the business continues to grow, a bigger space will be needed so it will be tried to rent the upstairs space or a new bigger location in another building.

## 10.2. Suppliers

The only component that will be provided by external companies are the sensors that are going to be installed in all libraries in order to count how many people are inside each library in real time.

Within all businesses that offer sensors capable of doing what BibApp needs, it has been decided to choose 30MHz sensors.



The factors that had been taken into account for the deciding the best option are the following: cost, proximity, accuracy, user's intervention, repair service...

In the appendix pages 4 to 27 it can be seen which criteria has been followed to choose the best option for BibApp within all the different possible options.

### 10.3. Ecological Analysis

When developing the app, the ecological impact that is going to be produced is not very high. It is not necessary to use any component that produces high pollution, or that generates a negative impact into the environment.

What it is certain is that developing this app that informs about libraries occupancy, and avoids people doing unnecessary commutes, pollution is being reduced. Many people go to libraries by car, motorbike or public transport. If they are able to know that the library is full before travelling with any transport mean, emissions are being reduced. The number of routes by cars, motorbikes, etc. will be reduced, avoiding doing the ones unnecessary.

For this reason, it can be said that BibApp has a positive impact into ecological environment reducing pollution and emissions in routes that are unnecessary.

### 10.4. Legal Environment

Libraries: There are a few laws subjected to Spanish legislation related to libraries and museums that must be taken into account, because there are involved in our project due to the fact that this is aimed at the communication of availability of empty seats in libraries. It is necessary to know the related law to libraries for the reason that it is needed to have space and permission for locating the sensors to count the people inside a library.

- “Ley 1/2015, de 24-03-2015, reguladora de la Biblioteca Nacional de España. BOE.Nº 72.25-03-2015”
- “Ley 10/2007, de 22-06-2007, de la lectura, del libro y de las bibliotecas. BOE.Nº 150.23-06-200”

Data protection: these laws are taken into account because when using 3D sensors for counting people, it can be known the location of people. The laws mention below are mandatory rules, due to the fact that certain data is private and cannot be used with non-desirable purposes.

- *“Resolución 03-11-2008, de la Agencia Española de Protección de Datos, por la que se modifica la Resolución 01-09-2006, por la que se determina la información que contiene el Catálogo de Ficheros inscritos en el Registro General de Protección de Datos. BOE.Nº 274.13-11-200”*
- *“Llei 29/2010, del 03-08-2010, de l'ús dels mitjans electrònics al sector públic de Catalunya. DOGC.Nº 5687.06-08-2010”*

Electronic compatibility: this law will be applied because electronic devices, sensors, are used to count the quantity of people that are inside each of the libraries where our service will be provided.

- *“Real Decreto 186/2016, de 06-05-2016, por el que se regula la compatibilidad electromagnética de los equipos eléctricos y electrónicos. BOE.Nº 113.10-05-2016”*

## 10.5. Process and Procedure

### 1. Service delivery

As our app is developed to be used for both iOS and Android devices, BibApp will be delivered by the most used platforms for downloading apps. These are App Store for iOS devices and Google play for Android.

People interested in using BibApp, will be able to download and update the app through these two platforms.

For measuring the customer's satisfaction and keeping quality control the following actions are going to be done:



BibApp will have two main ways for obtaining user's feedback: direct and indirect feedback. Direct feedback is gathered by encouraging users to directly state what they think about the app by means of questionnaires or pop-up boxes. Indirect feedback is based on the analysis of user behavior, such as how they move through the UI, how much time they spend on a page, their click-frequency, user retention and active periods, etc.

Direct feedback will be obtained by:

- Possibility of rating the app either in App store or in Google play. Both platforms count with an app review where we can see how much people like or find useful the app.
- Also, once a week there will be a possibility of rating the app through a very short and quick survey inside the app for users, or through a pop-up.
- When downloading the app, it is necessary to register, and one compulsory field is the user's mail. Once in a while, a mail will be sent to users for rating the app.
- Finally, in universities this same little survey mentioned before will be delivered through university mails or people outside university campus.

For controlling the correct functioning of the app, the research and development team will receive and immediate alarm if the app stops working, has any small problem that blocks users from using the app.

There will always be someone standing guard 24/7 in case some problem obstructs the app functionality.

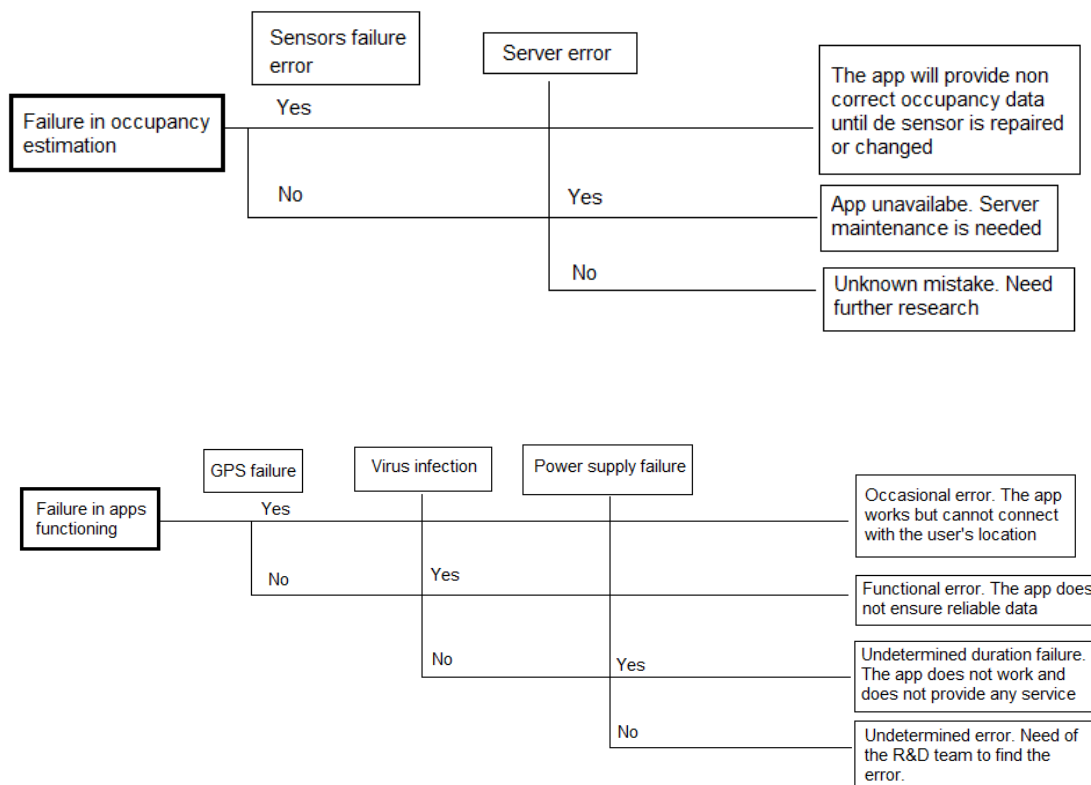
Also, every day at working hours, the research and development team will be testing and checking the app in order to detect possible time lags, correct functioning of all app functions, service saturation, etc. One important part of their job is to analyze that there is no single mistake, as unimportant as it can be, in all app operations.

The server will always be updated with the last version and checked with the intention of achieving the fact that the app never gets hanged.

One of BibApp policies is never to lose a user for software problems, offer the maximum reliability as possible.

There is another essential component that must be controlled, the sensor located on each library, because one failure of these devices can provide misinformation. If one user goes to a library because BibApp informs that there is a place in the library but when they arrived, sees that the library is already full, this is a lost user for good. This mistake can never happen.

In order to avoid it, BibApp does not need to employ special people for this, because when buying the sensors, this is a service that it is included in the offer.



## 2. Customer service and tracking

The secret to gain that first users become regular users is following clients up, in such a way that a positive effect is achieved on them. For achieving this, as soon as someone downloads the app, an email or a notification will be sent to the user



in order to thank for downloading the app and also to find out if the app fulfills their desires.

A questionnaire will be created so that the customer values the satisfaction with the app a few weeks later of the download.

In the webpage will be available a suggestion box for users to give their opinion, to know what users want and keep the app updated.

Customer service consists of a collective set of policies that govern every way someone interact with their customers. It encompasses everything from how much parking a company has available to how customers are greeted, handle service complaints, and back up a product or service. At its core, quality customer service is about making sure customers feel they are valued, treated fairly, and appreciated by a business.

These days, people only stay loyal to a company if they have very good reasons to. Otherwise, there is plenty of competition available they could choose to move to. For achieving that customer's stay loyal it is decided to provide the best customer service as possible.

When studies and surveys have been completed, they continue to find that a large group of consumers prefer to pay more but have a great customer service.

Word of mouth is the most powerful ally that any business can have by their side. What customers say to others could make or break a business. When the best customer service is provided, people will remember you.





## 11. Financial Plan

It has been taking into account the following considerations:

- Web site and Application depreciation (Software applications): 25%
- Hardware depreciation: (33%)
- The average payment period from clients for sensor's sales: 60 days
- The average payment period from suppliers for sensor's purchases: 30 days
- Collection of publicity and downloads: cash collection
- The rest of expenses: cash payment
- Income tax expense reduced rate 15% new creation enterprises during the first two years of benefits, and 25% the resting years
- The share premium is calculated according to total necessities during the first two years
- A transitory necessity of treasury is covered with a loan from the partners of 3.000€
- Standard rate of VAT of 21%
- Standard rate of IRPF deductions of 15%

### 11.1. General Cost and Expenses

As downloads and incomes for the first year, especially the first months are going to be small, is it going to try to spend the less as possible, using as much as possible things that we are already in possession of. These things are:

- 2 Laptops
- Office supplies such as paper, pencils, pens, markers, etc.
- 1 Home printer
- 2 particular mobile phones

## Expenses for the first's years:

### General administrative expenses

- Coworking space: Carrer de Calatrava, 1, 08017 Barcelona. Price: 200€ per month
- Printer cartridge black: HP 301 Black. Price: 18.98€
- Printer cartridge color: HP 301 Combo Tricolor. Price: 26,99€
- App cost to be in App Store: 99€ per year
- App cost to be in Google Play: 25€

### Other expenses

- Sensors gateway monthly cost: 25€ per sensor per month
- App maintenance: to create new content, updates, track how the app is performing, and let users know what is new. Price: 20% of the initial development cost<sup>23</sup>, 165€ per month
- Website maintenance: 150 € per month
- Cost per download: owners of an app must pay a cost to Google, Apple, etc. for every download they obtain. Price: 0.4€
- Cost of transferring data from sensors to data base: 4€ per sensor per month
- Travel: is estimated a total of 6.000€ per year to travel to other countries around Europe for selling BibApp service's.

### Financial Expenses:

- Notary expenses to formalize the Company's Memorandum of Association. Price 600€
- Attorney and Tax Executive to formalize the statutes, shareholders agreement and all the commencement of operation papers. Price 1000€
- Commercial register. Price 250€

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<sup>23</sup> <https://www.app-press.com/blog/whats-the-cost-to-maintain-an-app>



- Director social security cost: Price: 50€/month per person during the first two years and the for the resting years 314€ per month and per person
- Social security system cost. Price: approximately 35% of gross salary
- Civil liability insurance: Price 250€ per year
- Tax consultant all expenses included: 120€ per month once the company begins to obtain benefit, and this price will grow annually as the number of BibApp employees grows.

### Capital Expenses

- Sensors: For detecting how many people are inside a library. Price: 770€ per sensor with a 5% discount
- Laptops: Laptop HP 250 G5. Price: 459, 13 €

### Marketing and Promotion Expenses

- Stationery: Including brochures, flyers, etc. Price: 680€
- Social media: the cost of social media is estimated to be around 150€ per year. This cost is to pay for premium accounts in different social media such as LinkedIn.
- Influencers: Influencers will be hired to post photos using and promoting the app. Price: Between 50€ and 150€ per photo total of 500€ per year
- Promotional video: for attracting more users and updated every year to translated into new languages, including new services and updates of the app, etc. Price: 1000€
- Logo design: as the logo has been design by us, there is no expense for designing the logo.
- Publicity campaign: including promotional videos, reaching out to influencers and other similar expenses. Price: 1.000€
- Stands: This includes the cost of having a stand in university forums and similar spaces. Price: 150€
- App development: to develop the app it will be necessary 2 months and a total expense of 10.000€

- Web site development: For estimating the cost of the website it is used the WebpageFX calculator. The approximately price of creating the website will be: 14.571€

		LOW
Number of pages	1 - 10	\$ 1,000
Style of design	Simple yet attractive	\$ 2,000
Copywriting # of pages	5-10	\$ 1,000
SEO w/ Placement Guarantee	80 keywords	\$ 4,000
Responsive Design	Yes	\$ 3,000
Database Integration	Advanced	\$ 4,000
e-Commerce Functionality	None	\$ 0
CMS	Standard	\$ 2,000
<b>Total Estimated Quote</b>		<b>\$ 17,000</b>

Table 28. estimated annual quote for the creation, maintenance and future evolution of the BibApp website

There is a high amount of things that are not included in the list and table of the estimation costs because as being established in a coworking space the price of the light, water, cleaning service, optical fiber and furniture is included with the 200€ monthly expense.

For the first year, in order to save money, it is decided to hire freelancers for special tasks instead of hiring a person for the whole year. Reasons for hiring freelancers:

1. Affordability: there are no lots of general expenses due to the fact that freelancers work from home.
2. Flexibility: When hiring an employee, no matter if they have a full-time or part-time contract, it is very common the fact of paying more hours to the employee to what it is really needed. This cuts into the productivity and profitability of the business. Hiring freelancers, it is a very much better alternative because you are going to pay what it is actually needed for developing the specific task.



3. Find top experts: as freelances are hiring for doing a specific task, it is possible to hire the best freelance for every task needed. It can now be performed the different tasks that the business needs by the best workers in the market.
4. Independence: once an employee is hired, it is necessary to spend a lot of time to explain how the company works, how to the job which they are hired for, etc. Furthermore, wasting time entails wasting money. Hiring freelances it is a better option for companies because, although it is necessary to explain and defines the work parameters and what is needed clearly, they are used to working solo, it is not necessary to explain everything or spend time training them for doing their specific task. It is also a very good option because companies have the freedom to shift between different freelances as it is needed and when they finish performing their job, they can always leave the company without any messiness.

For the reasons mentioned above and many others, freelancers will be hired the first year. On one side, freelancer's programmers will be hired for developing the app as well as the website. On the other, a Tax Executive freelancer will be hired for taking care of taxes, preparing contracts for new employees, etc.

Detail	March 2018	April 2018	May 2018	June 2018	July 2018	August 2018
General Administrative Expenses						
Coworking	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Phone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge black	66,05 €	0,00 €	0,00 €	0,00 €	0,00 €	66,05 €
Printer cartridge color	76,61 €	0,00 €	0,00 €	0,00 €	0,00 €	76,61 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Optical fiber	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	99,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	25,00 €	0,00 €	0,00 €	0,00 €
Other Expenses						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Gateway Sensors	0,00 €	0,00 €	125,00 €	125,00 €	125,00 €	125,00 €
App Maintenance	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Web site Maintenance	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost per download	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	0,00 €	0,00 €	20,00 €	20,00 €	20,00 €	20,00 €
Travel	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cleaning services	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial Expenses						
Notary	600,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	1.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	250,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €
Social security cost	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Civil liability insurance	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Sensors	0,00 €	0,00 €	3.850,00 €	0,00 €	0,00 €	23.408,00 €
Marketing and Promotion Expenses						
Social media	0,00 €	0,00 €	12,50 €	12,50 €	12,50 €	12,50 €
Stationery	0,00 €	0,00 €	100,00 €	100,00 €	0,00 €	0,00 €
Publicity	0,00 €	100,00 €	100,00 €	100,00 €	0,00 €	0,00 €
Web site development	4.857,00 €	4.857,00 €	4.857,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Influencers	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App development	5.000,00 €	5.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>12.149,66 €</b>	<b>10.257,00 €</b>	<b>9.488,50 €</b>	<b>657,50 €</b>	<b>457,50 €</b>	<b>24.008,16 €</b>

Table 29. Total costs between march and august 2018. Source: own elaboration



Detail	September 2018	October 2018	November 2018	December 2018	January 2019	February 2019
General Administrative Expenses						
Coworking	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Phone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge black	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	66,05 €
Printer cartridge color	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	76,61 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Optical fiber	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Other Expenses						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Gateway Sensors	1.725,00 €	1.725,00 €	1.725,00 €	1.725,00 €	1.725,00 €	1.725,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	24,00 €	96,00 €	192,00 €	264,00 €	312,00 €	144,00 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	276,00 €	276,00 €	276,00 €	276,00 €	276,00 €	276,00 €
Travel	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	2.000,00 €
Cleaning services	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €
Social security cost	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Civil liability insurance	250,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	120,00 €	120,00 €	120,00 €	120,00 €	140,00 €	140,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	459,13 €
Sensors	23.408,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Marketing and Promotion Expenses						
Social media	12,50 €	12,50 €	12,50 €	12,50 €	12,50 €	12,50 €
Stationery	60,00 €	60,00 €	60,00 €	100,00 €	100,00 €	100,00 €
Publicity	100,00 €	150,00 €	150,00 €	150,00 €	150,00 €	100,00 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	1.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	50,00 €	0,00 €	0,00 €	50,00 €	50,00 €	50,00 €
Influencers	150,00 €	0,00 €	0,00 €	150,00 €	0,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>26.790,50 €</b>	<b>4.054,50 €</b>	<b>3.150,50 €</b>	<b>3.462,50 €</b>	<b>3.380,50 €</b>	<b>5.764,29 €</b>

Table 30. Total costs between September 2018 and February 2019. Source: own elaboration

Detail	March 2019	April 2019	May 2019	June 2019	July 2019	August 2019
General Administrative Expenses						
Coworking	300,00 €	300,00 €	300,00 €	300,00 €	300,00 €	300,00 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Phone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge black	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	66,05 €
Printer cartridge color	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	76,61 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Optical fiber	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	99,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Other Expenses						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Gateway Sensors	2.350,00 €	2.350,00 €	2.350,00 €	2.350,00 €	2.350,00 €	2.350,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	272,00 €	353,60 €	435,20 €	462,40 €	27,20 €	0,00 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	376,00 €	376,00 €	376,00 €	376,00 €	376,00 €	376,00 €
Travel	2.000,00 €	2.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cleaning services	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €
Social security cost	700,00 €	700,00 €	700,00 €	700,00 €	700,00 €	700,00 €
Civil liability insurance	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	140,00 €	140,00 €	140,00 €	140,00 €	140,00 €	140,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Sensors	9.143,75 €	9.143,75 €	0,00 €	0,00 €	0,00 €	20.482,00 €
Marketing and Promotion Expenses						
Social media	12,50 €	12,50 €	12,50 €	12,50 €	12,50 €	12,50 €
Stationery	0,00 €	0,00 €	100,00 €	100,00 €	0,00 €	0,00 €
Publicity	100,00 €	100,00 €	100,00 €	100,00 €	0,00 €	0,00 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	0,00 €	50,00 €	50,00 €	0,00 €	0,00 €	0,00 €
Influencers	0,00 €	150,00 €	75,00 €	75,00 €	0,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>15.809,25 €</b>	<b>16.090,85 €</b>	<b>5.152,70 €</b>	<b>5.030,90 €</b>	<b>4.320,70 €</b>	<b>24.918,16 €</b>

Table 31. Total costs between march 2019 and august 2019. Source: own elaboration





Detail	September 2019	October 2019	November 2019	December 2019	January 2020	February 2020
General Administrative Expenses						
Coworking	300,00 €	300,00 €	300,00 €	300,00 €	300,00 €	300,00 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Phone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge black	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	66,05 €
Printer cartridge color	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	76,61 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Optical fiber	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Other Expenses						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Gateway Sensors	3.750,00 €	3.750,00 €	3.750,00 €	3.750,00 €	3.750,00 €	3.750,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	310,46 €	1.034,86 €	1.448,80 €	2.897,60 €	3.622,00 €	1.034,86 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	600,00 €	600,00 €	600,00 €	600,00 €	600,00 €	600,00 €
Travel	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	2.000,00 €
Cleaning services	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €
Social security cost	700,00 €	700,00 €	700,00 €	700,00 €	700,00 €	700,00 €
Civil liability insurance	250,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	140,00 €	140,00 €	140,00 €	140,00 €	140,00 €	150,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	459,13 €
Sensors	20.482,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Marketing and Promotion Expenses						
Social media	12,50 €	12,50 €	12,50 €	12,50 €	12,50 €	25,00 €
Stationery	60,00 €	0,00 €	60,00 €	80,00 €	100,00 €	100,00 €
Publicity	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	150,00 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	500,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	50,00 €	0,00 €	0,00 €	50,00 €	50,00 €	50,00 €
Influencers	100,00 €	0,00 €	0,00 €	100,00 €	0,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>27.269,96 €</b>	<b>7.552,36 €</b>	<b>7.526,30 €</b>	<b>9.145,10 €</b>	<b>9.789,50 €</b>	<b>9.876,65 €</b>

Table 32. Total costs between September 2019 and February 2020. Source: own elaboration

Detail	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020
General Administrative Expenses						
Coworking	350,00 €	350,00 €	350,00 €	350,00 €	350,00 €	350,00 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Phone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge black	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	66,05 €
Printer cartridge color	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	76,61 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Optical fiber	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	99,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Other Expenses						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Gateway Sensors	8.825,00 €	8.825,00 €	8.825,00 €	8.825,00 €	8.825,00 €	8.825,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	3.364,27 €	4.205,33 €	5.046,40 €	5.887,46 €	420,53 €	0,00 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	1.412,00 €	1.412,00 €	1.412,00 €	1.412,00 €	1.412,00 €	1.412,00 €
Travel	2.000,00 €	2.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cleaning services	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €
Social security cost	806,33 €	806,33 €	806,33 €	806,33 €	806,33 €	806,33 €
Civil liability insurance	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Capital Expenses						
Laptop	459,13 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Sensors	74.247,25 €	74.247,25 €	0,00 €	0,00 €	0,00 €	0,00 €
Marketing and Promotion Expenses						
Social media	25,00 €	25,00 €	25,00 €	25,00 €	25,00 €	25,00 €
Stationery	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €
Publicity	100,00 €	150,00 €	100,00 €	150,00 €	100,00 €	150,00 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	50,00 €	50,00 €	50,00 €	50,00 €	50,00 €	50,00 €
Influencers	0,00 €	150,00 €	150,00 €	150,00 €	0,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>92.831,98 €</b>	<b>93.413,91 €</b>	<b>18.056,73 €</b>	<b>18.848,79 €</b>	<b>13.181,86 €</b>	<b>12.953,99 €</b>

Table 33. Total costs between march 2020 and august 2020. Source: own elaboration



Detail	September 2020	October 2020	November 2020	December 2020	January 2021	February 2021
General Administrative Expenses						
Coworking	350,00 €	350,00 €	350,00 €	350,00 €	350,00 €	350,00 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Phone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge black	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Printer cartridge color	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Optical fiber	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Other Expenses						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Gateway Sensors	8.825,00 €	8.825,00 €	8.825,00 €	8.825,00 €	8.825,00 €	8.825,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	6.454,25 €	3.872,55 €	5.163,40 €	9.035,95 €	9.681,38 €	1.290,85 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	1.412,00 €	1.412,00 €	1.412,00 €	1.412,00 €	1.412,00 €	1.412,00 €
Travel	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cleaning services	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €
Social security cost	806,33 €	806,33 €	806,33 €	806,33 €	806,33 €	806,33 €
Civil liability insurance	250,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Sensors	0,00 €	0,00 €	0,00 €	3.657,50 €	0,00 €	0,00 €
Marketing and Promotion Expenses						
Social media	25,00 €	25,00 €	25,00 €	25,00 €	25,00 €	25,00 €
Stationery	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €	100,00 €
Publicity	100,00 €	150,00 €	100,00 €	150,00 €	100,00 €	100,00 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	500,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	50,00 €	50,00 €	50,00 €	50,00 €	50,00 €	50,00 €
Influencers	150,00 €	0,00 €	0,00 €	150,00 €	0,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>19.615,58 €</b>	<b>17.183,88 €</b>	<b>17.924,73 €</b>	<b>25.654,78 €</b>	<b>22.442,71 €</b>	<b>14.052,18 €</b>

Table 34. Total costs between September 2020 and February 2021. Source: own elaboration

For the sixth year, BibApp is planning to leave the coworking space and start renting its own business. For this reason, the costs are going to be slightly different and the things that BibApp will need to buy are specified in the table below:

Concept	Detail	Units	Price	Total Price
Office	Printer	1	297,81 €	297,81 €
	Coffee machine	1	67,89 €	67,89 €
	Water dispenser	1	24,09 €	24,09 €
	Office supplies	-	110,00 €	110,00 €
	Computer	4	459,13 €	1.836,52 €
	Chair	8	44,99 €	359,92 €
	Desk	1	173,99 €	173,99 €
	Shelf	1	230,00 €	230,00 €
	Bin	2	5,00 €	10,00 €
	Cupboard	1	129,00 €	129,00 €
	Hanger	1	10,00 €	10,00 €
	Big office table	2	291,00 €	582,00 €
	Telephone	3	34,95 €	104,85 €
	Whiteboard	1	19,99 €	19,99 €
	Company plate	1	60,00 €	60,00 €
	First-Aid Kit	1	15,99 €	15,99 €
	Company sign	1	43,00 €	43,00 €
	Printer Cartridge Black	2	66,05 €	132,10 €
	Printer Cartridge Color	2	76,61 €	153,22 €
Toilet	Toilet paper holder	1	14,99 €	14,99 €
	Hand dryer	1	98,46 €	98,46 €
	Hygiene materials	-	100,00 €	100,00 €
	Toilet cupboard	1	38,25 €	38,25 €
	Vacuum	1	47,99 €	47,99 €
Other Expenses	Optical Fibre	-	26,90 €	26,90 €
	Light	-	45,00 €	45,00 €
	Water	-	35,00 €	35,00 €
	Rent	-	600,00 €	600,00 €
	Cleaning Service	-	10,00 €	10,00 €

Table 35. BibApp's needs for the sixth year. Source: own elaboration

General and administrative budget:

- 1 Printer: HP PageWide 377dw A4 Wi-Fi. Price: 297,81 € (Original price: 399 € with 25% discount in Amazon)



- 1 Coffee machine: DeLonghi Nespresso Inissia EN 80.B. Price: 67,89€ (Original Price: 99 with 31% discount in Amazon)
- 1 Water dispenser: Includes water dispenser, cleaning service, 2 bottles of 19L per month, bottle collection and delivery service. Price 21.90€ plus 10% IVA, total 24,09€ in Eden.
- Office supplies: includes paper, writing material, ring binders, markers, staplers, envelopes, archive material, etc. Price: 110€ every 5 months
- 8 Chairs: RENBERGET, swivel chair, black Bomstad. Price: 44,99 € in Ikea
- 1 Desk: Individual desk for the CEO, LINNMON / ALEX. Price: 173, 99 € in Ikea.
- 1 Big Shelf for storing papers and office supplies: BILLY. Price: 230,00 € in Ikea
- 2 Bins: DOKUMENT. Price: 5€ in Ikea
- 1 Cupboard: HÄLLAN. Price: 129,00 € in Ikea
- 1 Hanger for coats: TJUSIG. Price: 10€ in Ikea
- 2 Big office tables where the rest of employees will work, GERTON / ALEX. Price: 291,00 € in Ikea
- 3 Telephones: MAXCOM, MM28D. Price: 34,95€ (Original price: 39,95€, 12,5% discount in [www.ielectro.es](http://www.ielectro.es))
- 1 Whiteboard for brainstorming and meetings, LUNS in Ikea
- 2 Printer Cartridge Black, HP 913A. Price: 66,05 €
- 2 Printer Cartridge Color, HP 913A. Price: 76,61 €
- 1 Toilet Paper Holder: Wangel roll holders toilet paper, patented adhesive + 3M Sticker, Aluminum, matte finish. Price: 14,99 € in Amazon
- 1 Hand dryer: Pro-Elec GSQ250B. Price: 98,46 € in Amazon
- Hygiene materials: broom, mop, trash courier, bucket, glass cleaner, windows cleaner, gloves, feather duster, soap, trash bags, brush. Estimated price: 100€
- 1 Toilet cupboard: FORES - 007141O, multipurpose cabinet furniture. Price: 38,25 € in Amazon
- 1 Vacuum: Shop Story Multifunctional Vacuum Pro X6 400 ml 76dB 600 W. Price: 47,99 €, in Amazon

- 1 First-Aid Kit: first-aid kit of 90 articles with ice bag, eye solution and isothermal blanket. Price: 15,99 € in Amazon
- 1 Company plate: 60€ in [www.rotuloslowcost.com](http://www.rotuloslowcost.com)
- 1 Company sign: 43€ in [www.rotuloslowcost.com](http://www.rotuloslowcost.com)
- Internet and phone: Movistar ADSL and 600Mb Optical Fiber. Price: 26,90€/per month.
- Location's rent: 600€ per month
- App cost to be in App Store: 99€/year
- App cost to be in Google Play: 25€

#### Cost of sales:

- Light: 45€ per month
- Water: 35€ per month
- Cleaning service: 80€ per month, 10€/hour x 2 hours per week
- App maintenance: 20% of the launch cost<sup>24</sup>: Price: 165€ per month
- Web site maintenance: 150€ per month
- Sensors gateway monthly cost: 25€ per sensor per month
- Cost of transferring data from sensors to data base: 4€ per sensor per month
- Cost per download: owners of an app must pay a cost to Google, Apple, etc. for every download they obtain. Price: 0.04€
- Travel: there is an estimated price of 6000€ per year for travelling to other countries in order to sale BibApp's service around the world.

#### Financial budget:

- Social security cost: 35% of the gross salary for employees. 48€ per month for interns.
- Director social security cost: the first two years 50€ per month and person and for the following years 314€ per month and per person
- Tax consultant: for income taxes, etc. Price: 200€ per month
- Local opening license: it is necessary to pay 750€ when a new local is opened.

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<sup>24</sup> <https://www.app-press.com/blog/whats-the-cost-to-maintain-an-app>



- Civil liability insurance: 250€ per year
- Urban municipal waste: 150€ per year

Capital budget:

- Laptops: Laptop HP 250 G5. Price: 459, 13 €
- Sensors: one sensor on each library. Price: 770€ with a 5% discount.

Development budget:

- Intellectual property: there is a law that do not allow to buy an application patent if it is not an I+D app

Marketing and promotion expenses:

- Stationery: Including brochures, flyers, etc. Price: 1500€ per year
- Publicity campaign: including promotional videos, reaching out to influencers and other similar expenses. Price: 2000€ per year
- Talks and stands: It is estimated a cost of 750€ per year to organize talks and stands that are going to take place in university forums. The dates will be chosen strategical: in the beginning of semesters and before starting exams period
- Social media: the cost of social media is estimated to be 500€ per year. This cost is to pay for premium accounts in different social media such as LinkedIn
- Influencers: Influencers will be hired to post photos using and promoting the app. Price: Between 50€ and 150€ per photo total of 1000€ per year
- Promotional video: for attracting more users and updated every year to translated into new languages, including new services and updates of the app, etc. Price: 1000€ per year
- Logo design: as the logo has been design by us, there is no expense for designing the logo.

Finally, the monthly expenses for the sixth year of BibApp are:

Detail	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023
General and Administrative Expenses						
Printer	297,81 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Coffee machine	67,89 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Chair	359,92 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	173,99 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	230,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	10,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cupboard	129,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Hanger	10,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Big office table	582,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Telephone	104,85 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	19,99 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Company plate	60,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
First-Aid Kit	15,99 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Company sign	43,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Toilet paper holder	14,99 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Hand dryer	98,46 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Toilet cupboard	38,25 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Vacuum	47,99 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water dispenser	24,09 €	24,09 €	24,09 €	24,09 €	24,09 €	24,09 €
Office supplies	110,00 €	0,00 €	0,00 €	0,00 €	0,00 €	110,00 €
Optical Fibre	26,90 €	26,90 €	26,90 €	26,90 €	26,90 €	26,90 €
Printer Cartridge Black	132,10 €	0,00 €	0,00 €	0,00 €	132,10 €	0,00 €
Printer Cartridge Color	153,22 €	0,00 €	0,00 €	0,00 €	153,22 €	0,00 €
Hygiene materials	100,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	99,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Rent	600,00 €	600,00 €	600,00 €	600,00 €	600,00 €	600,00 €
Cost of Sales						
Light	45,00 €	45,00 €	45,00 €	45,00 €	45,00 €	45,00 €
Water	35,00 €	35,00 €	35,00 €	35,00 €	35,00 €	35,00 €
Gateway Sensors	12.625,00 €	12.625,00 €	12.625,00 €	12.625,00 €	12.625,00 €	12.625,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	13.074,89 €	16.997,35 €	20.919,82 €	22.227,31 €	1.307,48 €	0,00 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	2.020,00 €	2.020,00 €	2.020,00 €	2.020,00 €	2.020,00 €	2.020,00 €
Travel	4.000,00 €	4.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cleaning Service	80,00 €	80,00 €	80,00 €	80,00 €	80,00 €	80,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €
Social security cost	1.541,85 €	1.541,85 €	1.541,85 €	1.541,85 €	1.541,85 €	1.541,85 €
Civil liability insurance	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Local opening license	750,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Urban municipal waste	0,00 €	0,00 €	150,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Sensors	12.069,75 €	12.069,75 €	0,00 €	0,00 €	0,00 €	0,00 €





Detail	March 2023	April 2023	May 2023	June 2023	July 2023	August 2023
	Marketing and Promotion Expenses					
Social media	41,66 €	41,66 €	41,66 €	41,66 €	41,66 €	41,66 €
Stationery	125,00 €	125,00 €	125,00 €	125,00 €	125,00 €	125,00 €
Publicity	166,66 €	166,66 €	166,66 €	166,66 €	166,66 €	166,66 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	500,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Stand	62,50 €	62,50 €	62,50 €	62,50 €	62,50 €	62,50 €
Influencers	125,00 €	0,00 €	150,00 €	150,00 €	0,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
	Development Expenses					
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	49.294,31 €	52.103,76 €	39.855,48 €	40.913,97 €	20.129,46 €	18.646,66 €

Table 36. Total costs between march 2023 and august 2023. Source: own elaboration

Detail	September 2023	October 2023	November 2023	December 2023	January 2024	February 2024
General and Administrative Expenses						
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Coffee machine	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Chair	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cupboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Hanger	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Big office table	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Telephone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Company plate	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
First-Aid Kit	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Company sign	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Toilet paper holder	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Hand dryer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Toilet cupboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Vacuum	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Water dispenser	24,09 €	24,09 €	24,09 €	24,09 €	24,09 €	24,09 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	110,00 €	0,00 €
Optical Fibre	26,90 €	26,90 €	26,90 €	26,90 €	26,90 €	26,90 €
Printer Cartridge Black	0,00 €	0,00 €	132,10 €	0,00 €	0,00 €	0,00 €
Printer Cartridge Color	0,00 €	0,00 €	153,22 €	0,00 €	0,00 €	0,00 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in App Store	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
App cost to be in Google Play	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Rent	600,00 €	600,00 €	600,00 €	600,00 €	600,00 €	600,00 €
Cost of Sales						
Light	45,00 €	45,00 €	45,00 €	45,00 €	45,00 €	45,00 €
Water	35,00 €	35,00 €	35,00 €	35,00 €	35,00 €	35,00 €
Gateway Sensors	12.625,00 €	12.625,00 €	12.625,00 €	12.625,00 €	12.625,00 €	12.625,00 €
App Maintenance	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €	165,00 €
Web site Maintenance	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €	150,00 €
Cost per download	1.307,48 €	5.229,95 €	10.459,91 €	14.382,37 €	16.997,35 €	7.844,92 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	2.020,00 €	2.020,00 €	2.020,00 €	2.020,00 €	2.020,00 €	2.020,00 €
Travel	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cleaning Service	80,00 €	80,00 €	80,00 €	80,00 €	80,00 €	80,00 €
Financial Expenses						
Notary	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €	628,00 €
Social security cost	1.541,85 €	1.541,85 €	1.541,85 €	1.541,85 €	1.541,85 €	1.541,85 €
Civil liability insurance	250,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Local opening license	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Urban municipal waste	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Tax Consultant	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €	200,00 €
Capital Expenses						
Laptop	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Sensors	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €



Detail	September 2023	October 2023	November 2023	December 2023	January 2024	February 2024
Marketing and Promotion Expenses						
Social media	41,66 €	41,66 €	41,66 €	41,66 €	41,66 €	41,66 €
Stationery	125,00 €	125,00 €	125,00 €	125,00 €	125,00 €	125,00 €
Publicity	166,66 €	166,66 €	166,66 €	166,66 €	166,66 €	166,66 €
Web site development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	0,00 €	0,00 €	500,00 €	0,00 €	0,00 €	0,00 €
Stand	62,50 €	62,50 €	62,50 €	62,50 €	62,50 €	62,50 €
Influencers	125,00 €	0,00 €	150,00 €	150,00 €	150,00 €	0,00 €
App development	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>20.219,14 €</b>	<b>23.766,61 €</b>	<b>29.931,89 €</b>	<b>33.069,03 €</b>	<b>35.794,01 €</b>	<b>26.381,58 €</b>

Table 37. Total costs between September 2023 and February 2024. Source: own elaboration

Total expenses of BibApp during the first 6 years:

Detail	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
General Administrative Expenses						
Printer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	297,81 €
Coffee machine	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	67,89 €
Chair	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	359,92 €
Desk	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	173,99 €
Shelf	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	230,00 €
Bin	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	10,00 €
Cupboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	129,00 €
Hanger	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	10,00 €
Big office table	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	582,00 €
Telephone	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	104,85 €
Whiteboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	19,99 €
Company plate	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	60,00 €
First-Aid Kit	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	15,99 €
Company sign	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	43,00 €
Toilet paper holder	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	14,99 €
Hand dryer	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	98,46 €
Toilet cupboard	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	38,25 €
Vacuum	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	47,99 €
Water dispenser	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	289,08 €
Office supplies	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	330,00 €
Optical Fibre	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	322,80 €
Printer Cartridge Black	198,15 €	132,10 €	66,05 €	132,10 €	132,10 €	396,30 €
Printer Cartridge Color	229,83 €	153,22 €	76,61 €	153,22 €	153,22 €	459,60 €
Hygiene materials	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	100,00 €
App cost to be in App Store	99,00 €	99,00 €	99,00 €	99,00 €	99,00 €	99,00 €
App cost to be in Google Play	25,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Rent	2.400,00 €	3.600,00 €	4.200,00 €	5.400,00 €	6.000,00 €	7.200,00 €
Cost of Sales						
Light	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	540,00 €
Water	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	420,00 €
Gateway Sensors	10.850,00 €	36.600,00 €	105.900,00 €	121.500,00 €	141.600,00 €	151.500,00 €
App Maintenance	990,00 €	1.980,00 €	1.980,00 €	1.980,00 €	1.980,00 €	1.980,00 €
Web site Maintenance	900,00 €	1.800,00 €	1.800,00 €	1.800,00 €	1.800,00 €	1.800,00 €
Cost per download	1.032,00 €	11.898,98 €	54.422,36 €	101.700,04 €	122.247,88 €	130.748,88 €
VAT	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Cost of transferring data	1.736,00 €	5.856,00 €	16.944,00 €	18.628,00 €	18.896,00 €	24.240,00 €
Travel	2.000,00 €	6.000,00 €	4.000,00 €	6.000,00 €	6.000,00 €	8.000,00 €
Cleaning Service	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	960,00 €



Detail	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Financial Expenses						
Notary	600,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Attorney and Tax Executive	1.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Commercial register	250,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Director social security cost	1.200,00 €	1.200,00 €	7.536,00 €	7.536,00 €	7.536,00 €	7.536,00 €
Social security cost	0,00 €	8.400,00 €	9.675,96 €	11.652,00 €	18.162,00 €	18.502,20 €
Civil liability insurance	250,00 €	250,00 €	250,00 €	250,00 €	250,00 €	250,00 €
Local opening license	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	750,00 €
Urban municipal waste	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	150,00 €
Tax Consultant	760,00 €	1.690,00 €	1.800,00 €	2.160,00 €	2.400,00 €	2.400,00 €
Capital Expenses						
Computer	459,13 €	459,13 €	459,13 €	459,13 €	0,00 €	0,00 €
Sensors	50.666,00 €	59.251,50 €	152.152,00 €	38.038,00 €	49.010,50 €	24.139,50 €
Marketing and Promotion Expenses						
Social media	125,00 €	162,50 €	300,00 €	500,00 €	500,00 €	500,00 €
Stationery	680,00 €	600,00 €	1.200,00 €	1.500,00 €	1.500,00 €	1.500,00 €
Publicity	1.100,00 €	1.050,00 €	1.450,00 €	2.000,00 €	2.000,00 €	2.000,00 €
Web site development	14.571,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Logo design	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Promotional video	1.000,00 €	500,00 €	500,00 €	1.000,00 €	1.000,00 €	1.000,00 €
Stand	200,00 €	300,00 €	600,00 €	750,00 €	750,00 €	750,00 €
Influencers	300,00 €	500,00 €	750,00 €	1.000,00 €	1.000,00 €	1.000,00 €
App development	10.000,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
Development Expenses						
Intellectual Property	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €	0,00 €
<b>Total Costs</b>	<b>103.621,11 €</b>	<b>142.482,43 €</b>	<b>366.161,11 €</b>	<b>324.237,49 €</b>	<b>383.016,70 €</b>	<b>392.167,49 €</b>

Table 38. Total expenses between the six firsts years. Source: own elaboration

## 11.2. Salary Expenses

In the following table is shown the annual salary that the different employees of the company will receive during the first year. It has been decided to pay depending on their function, responsibilities and working hours.

Department	Function	First Annual Salary
Management	CEO	26.000 €
	CFO	13.260 €
	CTO	24.000 €
	CMO	13.260 €
Finances and Sales	Financial Employee	18.000 €
Marketing	Marketing Intern	4.800 €
R&D	Programmer Intern	4.000 €

Table 39. Annual salary for each employee. Source: own elaboration

As it has already been explained, both partners will be representative of the financial department and the marketing department and they will also take care of the management of the company. This is why, their salary has been divided, half is recorded in the CEO salary and the other half in the CFO and CMO salary respectively.

As the company grows and the profits are bigger, salaries are going to grow with a high percentage until more or less 2021 where it is established that for every year that an employee stays in the company, it will be an annual increase of their respective salary of 2%, except for the interns that will not have a raise in their salary. The salaries that each worker of the company will have in the following 6 years are:

Department	Function	Annual Salary 2018	Annual Salary 2019	Annual Salary 2020
Management	CEO	26.000 €	26.520 €	30.000 €
	CFO	0 €	13.260 €	15.000 €
	CTO	0 €	24.000 €	26.000 €
	CMO	0 €	13.260 €	15.000 €
Finances and Sales	Financial Employee	0 €	0 €	0 €
Marketing	Marketing Intern	0 €	0 €	0 €
R&D	Programmer Intern	0 €	0 €	4.000 €
<b>Total</b>		<b>52.000 €</b>	<b>77.040 €</b>	<b>90.000 €</b>

Table 40. Annual salary for each employee for the years 2018, 2019 and 2020. Source: own elaboration

Department	Function	Annual Salary 2021	Annual Salary 2022	Annual Salary 2023
Management	CEO	36.000 €	36.720 €	37.454 €
	CFO	18.000 €	18.360 €	18.727 €
	CTO	30.000 €	30.600 €	31.212 €
	CMO	18.000 €	18.360 €	18.727 €
Finances and Sales	Financial Manager	0 €	18.000 €	18.360 €
Marketing	Marketing Intern	4.800 €	4.800 €	4.800 €
R&D	Programmer	4.000 €	4.000 €	4.000 €
<b>Total</b>		<b>110.800 €</b>	<b>130.840 €</b>	<b>133.280 €</b>

Table 41. Annual salary for each employee for the years 2021, 2022 and 2023. Source: own elaboration



(\*) For the marketing intern is an estimation, because if the intern stays that long with the company, it will become an employee and the salary will slightly increase.

### 11.3. Income

There are about 6 existing different business models today in the mobile app business:

- Pay per download
- In-app advertising
- In-app purchasing
- Freemium
- Subscription
- Sponsorship

#### 1) Pay per download

This method consists on generating income from App Store directly as users download the app. The download of the app cost a determinate price fixed by the app creators and when someone wants to download the app, it is necessary for them to pay for it.

#### 2) In-app advertising

For this model, users do not need to pay for downloading the app. But they download the app full of advertisements and the way of making money for the app is through these ads.

#### 3) In-app purchasing

This method is defined normally as a free download app and revenue is generated through purchases inside the app. There is a part of the app that it is available for all users due to the fact that it is free and for obtaining the whole functionalities of the app is necessary to pay. This model is very common in games.

#### 4) Freemium

Apps that follow this method usually have two applications, one is free and the other one is a paid one. The free app is used as demo for showing how good and powerful the app is. Users will download the free app version first and once they see how useful it is, they will then download the paid app version.

#### 5) Subscription

Subscription is when users can use the service that the app offers as long as they pay a necessary fee. When paying the fee, the user has accessibility for a certain period of time, once this time is expired, for continuing receiving the service is necessary to pay again.

#### 6) Sponsorship

This is the newest model of the market. Sponsorship implies association with advertisers that provide awards for users for completing some actions of the app. Brands pay to be part of an incentive system. The app makes money by taking a part of the income from the redeemed rewards that brands offer.

The business models that BibApp that are going to be followed are in-app advertising and freemium. Since our app is addressed to mainly young people, the pay per download model is not an option because youth is normally reluctant to pay for apps. Also, as there is nothing that can be bought through our app, in-app purchasing is also ruled out. Neither subscription nor sponsorship are believed to be a good business model for BibApp.

It is decided to design two different apps, one free model for all users that use the app but are not willing to pay for it, and another premium version with more functionalities and more complete for the people that like and use the app very much and prefer more options and a better service. For this reason, BibApp will follow the Freemium business model.





Also, BibApp will earn money through advertisements inside the app, as it is expected to have a lot of users it is believed that in-app advertising will be a good method to earn money for our application.

There are a lot of possibilities in the market at the time of choosing the advertising manager. Such as Colonial, MoPub, AdMob, etc.

Using the forecast of downloads, and studying the advertisement funding is it going to estimate the income for the following years through in-app advertising:

It is the most common business method for free apps to make money and keep the business afloat in the market. There are three types of add revenue:

#### Cost per Thousand Impression (CPM)

Announcers that follows the CPM model, determines a price for every 1 thousand advertising publication appearance. It is decided by the advertisers where their ad is located inside the application. Apps that use this method for earning money get paid for displaying the app only. CPM's rates are low so this method is beneficial for apps that have a lot of users that sees the announcements posted in the app.

It seems very difficult to earn money through this method but there is a difference between impressions and page views. It is very usual the fact that one advertisement is located in two different spots of an application, for this reason, it is common that the number of ad impressions is different than the number of visits of the app.

The formula for cost per thousand (CPM) is:

$$CPM = \frac{\text{Cost of 1 Unit of a Media Program}}{\text{Size of Media Program's}} \times 1,000$$

#### Cost per Click (CPC)

Cos per click is a business model that consist on earning money every time one application users clicks on one of the advisements that the app announce. The app do not

just make money by displaying the app as the CPM model, it is necessary for earning money that the user actually clicks in the ad.

The formula for CPC is:

$$CPC = \frac{\text{Competitor AdRank}}{\text{Your Quality Score}} + 0.01$$

#### Cost per Action (CPA)

This last one model consist on earning money when users make a purchase, that is to say, advertisers only pay when users go to their website and buy something of their brand and this purchase can be traced to having seen the ad in our app, BibApp will not be paid for just click in the ad or for displaying the advertisement.

Now is it going to be estimated the publicity income that BibApp could possibly earn. For doing this estimation is it going to breakdown into different scenarios ad it has been done before, for estimating the number of downloads that BibApp will have:

Optimal click through ratio (CTR) for apps is around 1.5 – 2% and the average revenue per click is approximately 0.086 € for banner ads. Banner advertisements normally have a 30 seconds refresh rate; this means that every 30 seconds new ads will be displayed. Also it is assumed that users spend an average of 2 minutes in the app per day:

Not every person that downloads BibApp will use the app every day, especially during the months that are not necessary to study a lot. For estimating the number of users is it going to analyze each month for the first 2 years and a half as it has done in the downloads forecast.

It is estimated that the number of times that customers will use the app per every month of the year is the following:



Month	Uses per week
September 2018	0 days per week
October 2018	2 days per week
November 2018	5 days per week
December 2018	6 days per week
January 2019	6 days per week
February 2019	1 day per week
March 2019	2 days per week
April 2019	5 days per week
May 2019	6 days per week
June 2019	6 days per week
July 2019	1 day per week
August 2019	0 days per week

Table 42. Estimation of the uses of the app per week and month. Source: own elaboration

As September is when classes begin, students do not normally go to libraries for studying, in October, as mid-term exams are approaching students begin to go to libraries, and finally in November students begin to go often to libraries because there is a lot of students that have exams in December. Also, a lot of public universities have their exams period in January. For the following 6 month of the year, it has been done the same reasoning.

It is important to remember that the premium version do not have advertisements, so to the total number of downloads it is necessary to subtract the number of premium downloads.

- Number of ads shown per day = number of active users \* time spent on the app \* ads per minute  $\rightarrow \text{Number of users} \times 2 \times 2$
- Average number of clicks = number of ads \* click rate  $\rightarrow \frac{\text{number of ads} \times 2}{100}$
- Revenue through ads = Clicks \* RPM  $\rightarrow \text{Clicks} \times 0.086\text{€}$

The total income that BibApp will earn is calculated following the estimations and formulas mentioned above and it can be seen in the appendix page 49.

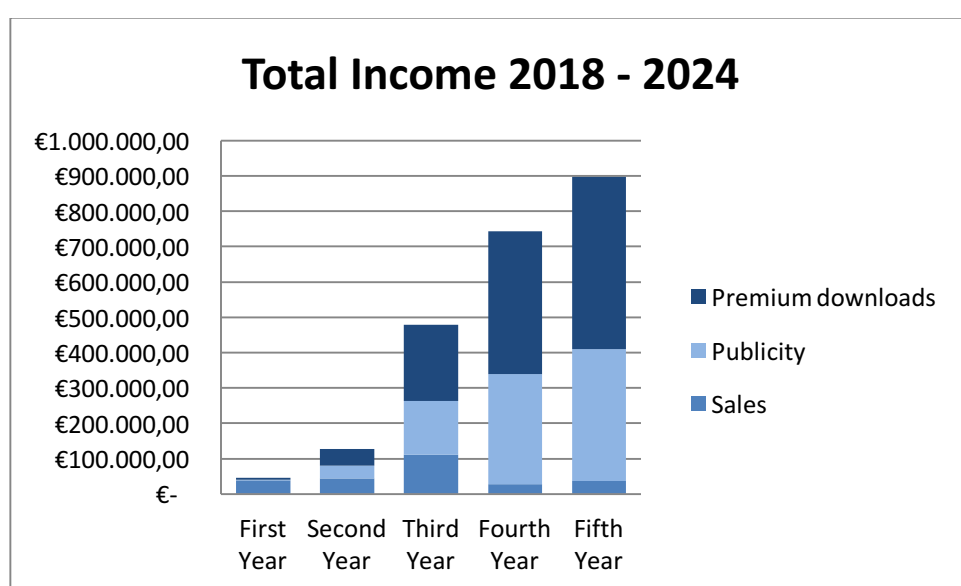
The income that BibApp will have does not only come from publicity. There is also available a premium version of the app that users that want to download it must pay 1,99€

just one time. The income that BibApp will have through this premium version, divided also in 3 different scenarios is calculated in the appendix page 55.

BibApp will also have another source of income; this is through the sales of the sensors to the libraries where BibApp will offer its service with a price of 550€ per sensor.

Total Revenue during the first sixth months:

### 11.3.1. Average Scenario



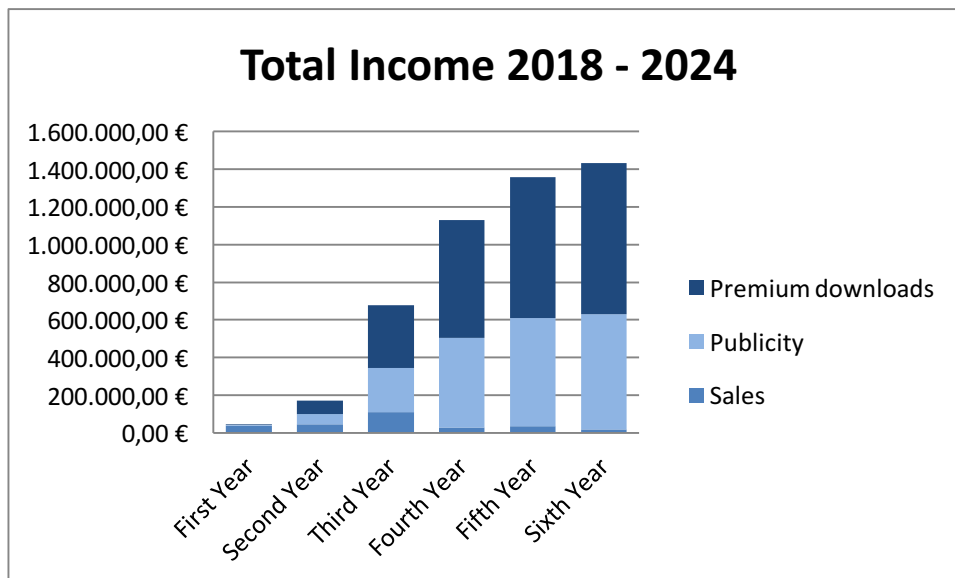
Graphic 49. Total income between 2018 and 2024 in the average scenario. Source: own elaboration

	Sales	Publicity	Premium downloads	Total Income
First Year	37.950,00 €	3.007,83 €	4.107,36 €	45.065,19 €
Second Year	44.550,00 €	36.199,58 €	47.358,02 €	<b>128.107,60 €</b>
Third Year	111.650,00 €	150.843,82 €	216.601,07 €	479.094,89 €
Fourth Year	28.600,00 €	310.273,32 €	404.766,00 €	<b>743.639,32 €</b>
Fifth Year	36.850,00 €	372.962,05 €	486.546,56 €	896.358,61 €
Sixth Year	18.150,00 €	398.897,47 €	520.380,54 €	<b>937.428,01 €</b>

Table 43. Total income per year and type of income in the average scenario. Source: own elaboration



### 11.3.2. Optimistic Scenario

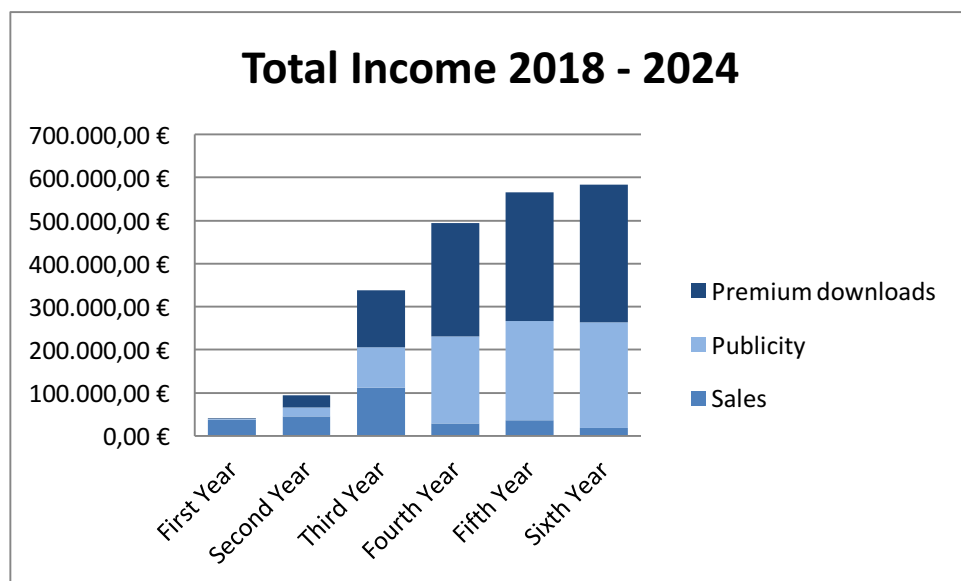


Graphic 50. Total income between 2018 and 2024 in the optimistic scenario. Source: own elaboration

	Sales	Publicity	Premium downloads	Total Income
First Year	37.950,00 €	3.579,31 €	4.887,76 €	46.417,07 €
Second Year	44.550,00 €	54.587,07 €	70.769,65 €	<b>169.906,72 €</b>
Third Year	111.650,00 €	234.619,68 €	333.232,50 €	679.502,18 €
Fourth Year	28.600,00 €	477.343,56 €	622.717,17 €	<b>1.128.660,73 €</b>
Fifth Year	36.850,00 €	573.787,70 €	748.533,09 €	1.359.170,79 €
Sixth Year	18.150,00 €	613.688,41 €	800.584,96 €	<b>1.432.423,37 €</b>

Table 44. Total income per year and type of income in the optimistic scenario. Source: own elaboration

### 11.3.3. Pessimistic Scenario



Graphic 51. Total income between 2018 and 2024 in pessimistic scenario. Source: own elaboration

	Sales	Publicity	Premium downloads	Total Income
First Year	37.950,00 €	1.431,73 €	1.955,10 €	41.336,83 €
Second Year	44.550,00 €	21.710,46 €	28.433,88 €	<b>94.694,34 €</b>
Third Year	111.650,00 €	93.847,75 €	133.296,17 €	338.793,92 €
Fourth Year	28.600,00 €	201.920,55 €	263.418,29 €	<b>493.938,84 €</b>
Fifth Year	36.850,00 €	229.515,03 €	299.415,40 €	565.780,43 €
Sixth Year	18.150,00 €	245.475,36 €	320.232,79 €	<b>583.858,15 €</b>

Table 45. Total income per year and type of income in the pessimistic scenario. Source: own elaboration



## 11.4.PROFIT AND LOSS

It has been done a profit and loss statement for the first 6 years in the 3 same scenarios mentioned before: average, optimistic and pessimistic:

### 11.4.1. Average Scenario

Profit & Loss - Income Statement	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
<b>REVENUE</b>	<b>45.065,19 €</b>	<b>128.107,60 €</b>	<b>479.094,89 €</b>	<b>743.639,32 €</b>	<b>896.358,61 €</b>	<b>937.428,01 €</b>
Sales	37.950,00 €	44.550,00 €	111.650,00 €	28.600,00 €	36.850,00 €	18.150,00 €
Sales - Sensors	37.950,00 €	44.550,00 €	111.650,00 €	28.600,00 €	36.850,00 €	18.150,00 €
<b>Other income</b>	<b>7.115,19 €</b>	<b>83.557,60 €</b>	<b>367.444,89 €</b>	<b>715.039,32 €</b>	<b>859.508,61 €</b>	<b>919.278,01 €</b>
Publicity	3.007,83 €	36.199,58 €	150.843,82 €	310.273,32 €	372.962,05 €	398.897,47 €
Premium downloads	4.107,36 €	47.358,02 €	216.601,07 €	404.766,00 €	486.546,56 €	520.380,54 €
<b>SUPPLIES</b>	<b>50.666,00 €</b>	<b>59.251,50 €</b>	<b>148.494,50 €</b>	<b>38.038,00 €</b>	<b>49.010,50 €</b>	<b>24.139,50 €</b>
Merchandise used	50.666,00 €	59.251,50 €	148.494,50 €	38.038,00 €	49.010,50 €	24.139,50 €
<b>PERSONAL EXPENSES</b>	<b>53.200,00 €</b>	<b>86.640,00 €</b>	<b>107.212,00 €</b>	<b>129.988,00 €</b>	<b>156.538,00 €</b>	<b>159.318,20 €</b>
Salaries and wages	52.000,00 €	77.040,00 €	90.000,00 €	110.800,00 €	130.840,00 €	133.280,00 €
Employee benefits expense	- €	8.400,00 €	9.676,00 €	11.652,00 €	18.162,00 €	18.502,20 €
Director social security cost	1.200,00 €	1.200,00 €	7.536,00 €	7.536,00 €	7.536,00 €	7.536,00 €
<b>OTHER OPERATING EXPENSES</b>	<b>26.724,98 €</b>	<b>73.171,80 €</b>	<b>196.338,03 €</b>	<b>266.552,72 €</b>	<b>308.308,20 €</b>	<b>339.716,49 €</b>
External services	22.447,00 €	66.886,48 €	192.195,37 €	260.267,40 €	302.022,88 €	328.827,67 €
Taxes	- €	- €	- €	- €	- €	- €
Others	4.277,98 €	6.285,32 €	4.142,66 €	6.285,32 €	6.285,32 €	10.888,82 €
<b>EBITDA</b>	<b>- 85.525,79 €</b>	<b>- 90.955,70 €</b>	<b>27.050,36 €</b>	<b>309.060,60 €</b>	<b>382.501,91 €</b>	<b>414.253,82 €</b>
AMORTIZATION AND DEPRECIATION	- €	6.294,26 €	6.445,77 €	6.597,28 €	6.597,28 €	303,02 €
<b>EBIT</b>	<b>- 85.525,79 €</b>	<b>- 97.249,96 €</b>	<b>20.604,59 €</b>	<b>302.463,32 €</b>	<b>375.904,63 €</b>	<b>413.950,80 €</b>
INCOME TAX EXPENSE	- €	- €	3.090,69 €	45.369,50 €	93.976,16 €	103.487,70 €
<b>NET PROFIT-PROFIT AND LOSS OF THE PERIOD</b>	<b>- 85.525,79 €</b>	<b>- 97.249,96 €</b>	<b>17.513,90 €</b>	<b>257.093,82 €</b>	<b>281.928,47 €</b>	<b>310.463,10 €</b>
<b>CASH FLOW</b>	<b>- 85.525,79 €</b>	<b>- 90.955,70 €</b>	<b>23.959,67 €</b>	<b>263.691,10 €</b>	<b>288.525,75 €</b>	<b>310.766,12 €</b>
Net profit	- 85.525,79 €	- 97.249,96 €	17.513,90 €	257.093,82 €	281.928,47 €	310.463,10 €
Amortization	- €	6.294,26 €	6.445,77 €	6.597,28 €	6.597,28 €	303,02 €

Table 46. Profit and loss in the average scenario. Source: own elaboration

## 11.4.2. Optimistic Scenario

Profit & Loss - Income Statement	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
<b>REVENUE</b>	<b>46.417,07 €</b>	<b>169.906,72 €</b>	<b>679.502,18 €</b>	<b>1.128.660,73 €</b>	<b>1.359.170,79 €</b>	<b>1.432.423,37 €</b>
Sales	37.950,00 €	44.550,00 €	111.650,00 €	28.600,00 €	36.850,00 €	18.150,00 €
Sales - Sensors	37.950,00 €	44.550,00 €	111.650,00 €	28.600,00 €	36.850,00 €	18.150,00 €
Other income	8.467,07 €	125.356,72 €	567.852,18 €	1.100.060,73 €	1.322.320,79 €	1.414.273,37 €
Publicity	3.579,31 €	54.587,07 €	234.619,68 €	477.343,56 €	573.787,70 €	613.688,41 €
Premium downloads	4.887,76 €	70.769,65 €	333.232,50 €	622.717,17 €	748.533,09 €	800.584,96 €
<b>SUPPLIES</b>	<b>50.666,00 €</b>	<b>59.251,50 €</b>	<b>148.494,50 €</b>	<b>38.038,00 €</b>	<b>49.010,50 €</b>	<b>24.139,50 €</b>
Merchandise used	50.666,00 €	59.251,50 €	148.494,50 €	38.038,00 €	49.010,50 €	24.139,50 €
<b>PERSONAL EXPENSES</b>	<b>53.200,00 €</b>	<b>86.640,00 €</b>	<b>107.212,00 €</b>	<b>129.988,00 €</b>	<b>156.538,00 €</b>	<b>159.318,20 €</b>
Salaries and wages	52.000,00 €	77.040,00 €	90.000,00 €	110.800,00 €	130.840,00 €	133.280,00 €
Employee benefits expense	- €	8.400,00 €	9.676,00 €	11.652,00 €	18.162,00 €	18.502,20 €
Director social security cost	1.200,00 €	1.200,00 €	7.536,00 €	7.536,00 €	7.536,00 €	7.536,00 €
<b>OTHER OPERATING EXPENSES</b>	<b>26.921,06 €</b>	<b>79.054,16 €</b>	<b>225.642,41 €</b>	<b>321.314,28 €</b>	<b>374.133,96 €</b>	<b>410.119,73 €</b>
External services	22.643,08 €	72.768,84 €	221.499,75 €	315.028,96 €	367.848,64 €	399.230,91 €
Taxes	- €	- €	- €	- €	- €	- €
Others	4.277,98 €	6.285,32 €	4.142,66 €	6.285,32 €	6.285,32 €	10.888,82 €
<b>EBITDA</b>	<b>- 84.369,99 €</b>	<b>- 55.038,94 €</b>	<b>198.153,27 €</b>	<b>639.320,45 €</b>	<b>779.488,33 €</b>	<b>838.845,94 €</b>
AMORTIZATION AND DEPRECIATION	- €	6.294,26 €	6.445,77 €	6.597,28 €	6.597,28 €	303,02 €
<b>EBIT</b>	<b>- 84.369,99 €</b>	<b>- 61.333,20 €</b>	<b>191.707,50 €</b>	<b>632.723,17 €</b>	<b>772.891,05 €</b>	<b>838.542,92 €</b>
INCOME TAX EXPENSE	- €	- €	28.756,13 €	94.908,48 €	193.222,76 €	209.635,73 €
<b>NET PROFIT-PROFIT AND LOSS OF THE PERIOD</b>	<b>- 84.369,99 €</b>	<b>- 61.333,20 €</b>	<b>162.951,38 €</b>	<b>537.814,69 €</b>	<b>579.668,29 €</b>	<b>628.907,19 €</b>
<b>CASH FLOW</b>	<b>- 84.369,99 €</b>	<b>- 55.038,94 €</b>	<b>169.397,15 €</b>	<b>544.411,97 €</b>	<b>586.265,57 €</b>	<b>629.210,21 €</b>
Net profit	- 84.369,99 €	- 61.333,20 €	162.951,38 €	537.814,69 €	579.668,29 €	628.907,19 €
Amortization	- €	6.294,26 €	6.445,77 €	6.597,28 €	6.597,28 €	303,02 €

Table 47. Profit and loss in the optimistic scenario. Source: own elaboration





### 11.4.3. Pessimistic Scenario

Profit & Loss - Income Statement	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
<b>REVENUE</b>	<b>41.336,83 €</b>	<b>94.694,34 €</b>	<b>338.793,92 €</b>	<b>493.938,84 €</b>	<b>565.780,43 €</b>	<b>583.858,15 €</b>
Sales	37.950,00 €	44.550,00 €	111.650,00 €	28.600,00 €	36.850,00 €	18.150,00 €
Sales - Sensors	37.950,00 €	44.550,00 €	111.650,00 €	28.600,00 €	36.850,00 €	18.150,00 €
<b>Other income</b>	<b>3.386,83 €</b>	<b>50.144,34 €</b>	<b>227.143,92 €</b>	<b>465.338,84 €</b>	<b>528.930,43 €</b>	<b>565.708,15 €</b>
Publicity	1.431,73 €	21.710,46 €	93.847,75 €	201.920,55 €	229.515,03 €	245.475,36 €
Premium downloads	1.955,10 €	28.433,88 €	133.296,17 €	263.418,29 €	299.415,40 €	320.232,79 €
<b>SUPPLIES</b>	<b>50.666,00 €</b>	<b>59.251,50 €</b>	<b>148.494,50 €</b>	<b>38.038,00 €</b>	<b>49.010,50 €</b>	<b>24.139,50 €</b>
Merchandise used	50.666,00 €	59.251,50 €	148.494,50 €	38.038,00 €	49.010,50 €	24.139,50 €
<b>PERSONAL EXPENSES</b>	<b>53.200,00 €</b>	<b>86.640,00 €</b>	<b>107.212,00 €</b>	<b>129.988,00 €</b>	<b>156.538,00 €</b>	<b>159.318,20 €</b>
Salaries and wages	52.000,00 €	77.040,00 €	90.000,00 €	110.800,00 €	130.840,00 €	133.280,00 €
Employee benefits expense	- €	8.400,00 €	9.676,00 €	11.652,00 €	18.162,00 €	18.502,20 €
Director social security cost	1.200,00 €	1.200,00 €	7.536,00 €	7.536,00 €	7.536,00 €	7.536,00 €
<b>OTHER OPERATING EXPENSES</b>	<b>26.184,21 €</b>	<b>68.417,03 €</b>	<b>175.406,34 €</b>	<b>231.036,96 €</b>	<b>261.289,72 €</b>	<b>289.428,46 €</b>
External services	21.906,23 €	62.131,71 €	171.263,68 €	224.751,64 €	255.004,40 €	278.539,64 €
Taxes	- €	- €	- €	- €	- €	- €
Others	4.277,98 €	6.285,32 €	4.142,66 €	6.285,32 €	6.285,32 €	10.888,82 €
<b>EBITDA</b>	<b>- 88.713,38 €</b>	<b>- 119.614,19 €</b>	<b>- 92.318,92 €</b>	<b>94.875,88 €</b>	<b>98.942,21 €</b>	<b>110.971,99 €</b>
AMORTIZATION AND DEPRECIATION	- €	6.294,26 €	6.445,77 €	6.597,28 €	6.597,28 €	303,02 €
<b>EBIT</b>	<b>- 88.713,38 €</b>	<b>- 125.908,45 €</b>	<b>- 98.764,69 €</b>	<b>88.278,60 €</b>	<b>92.344,93 €</b>	<b>110.668,97 €</b>
INCOME TAX EXPENSE	- €	- €	- €	13.241,79 €	13.851,74 €	27.667,24 €
<b>NET PROFIT-PROFIT AND LOSS OF THE PERIOD</b>	<b>- 88.713,38 €</b>	<b>- 125.908,45 €</b>	<b>- 98.764,69 €</b>	<b>75.036,81 €</b>	<b>78.493,19 €</b>	<b>83.001,73 €</b>
<b>CASH FLOW</b>	<b>- 88.713,38 €</b>	<b>- 119.614,19 €</b>	<b>- 92.318,92 €</b>	<b>81.634,09 €</b>	<b>85.090,47 €</b>	<b>83.304,75 €</b>
Net profit	- 88.713,38 €	- 125.908,45 €	- 98.764,69 €	75.036,81 €	78.493,19 €	83.001,73 €
Amortization	- €	6.294,26 €	6.445,77 €	6.597,28 €	6.597,28 €	303,02 €

Table 48. Profit and loss in the pessimistic scenario. Source: own elaboration

## 11.5. Balance Sheet

Following the same procedure as above, it has been done the balance sheet for also the first six years, and the three different scenarios are also studied:

### 11.5.1. Average Scenario:

BALANCE SHEET						
ASSETS	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
<b>NON CURRENT ASSETS</b>	<b>25.030,13 €</b>	<b>19.195,00 €</b>	<b>13.208,35 €</b>	<b>7.070,19 €</b>	<b>472,90 €</b>	<b>169,88 €</b>
Web site	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €
(Amortization)	-	3.642,75 € -	7.285,50 € -	10.928,25 € -	14.571,00 € -	14.571,00 €
App software	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €
(Amortization)	-	2.500,00 € -	5.000,00 € -	7.500,00 € -	10.000,00 € -	10.000,00 €
Office equipment	459,13 €	918,26 €	1.377,39 €	1.836,52 €	1.836,52 €	1.836,52 €
(Amortization)	-	151,51 € -	454,54 € -	909,08 € -	1.363,62 € -	1.666,64 €
<b>CURRENT ASSETS</b>	<b>103.186,23 €</b>	<b>12.892,78 €</b>	<b>56.017,46 €</b>	<b>364.171,83 €</b>	<b>708.411,69 €</b>	<b>1.028.085,96 €</b>
Goods for resale	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €
Trade receivable	7.653,25 €	8.984,25 €	22.516,08 €	5.767,60 €	7.431,41 €	3.660,25 €
Public entities (VAT)	1.697,10 €	226,57 €	- €	- €	- €	- €
Cash	90.178,38 €	24,46 €	29.843,88 €	354.746,73 €	697.322,78 €	1.020.768,21 €
<b>TOTAL ASSETS</b>	<b>128.216,36 €</b>	<b>32.087,78 €</b>	<b>69.225,81 €</b>	<b>371.242,02 €</b>	<b>708.884,59 €</b>	<b>1.028.255,84 €</b>
<b>EQUITY AND LIABILITIES</b>						
<b>EQUITY</b>	<b>117.474,21 €</b>	<b>20.224,25 €</b>	<b>37.738,15 €</b>	<b>294.831,97 €</b>	<b>576.760,45 €</b>	<b>887.223,55 €</b>
Capital	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €
Share premium	200.000,00 €	200.000,00 €	200.000,00 €	200.000,00 €	200.000,00 €	200.000,00 €
Previous years results	- € -	85.525,79 € -	182.775,75 € -	165.261,85 €	91.831,97 €	373.760,45 €
Profit and loss for the period	- 85.525,79 € -	97.249,96 €	17.513,90 €	257.093,82 €	281.928,47 €	310.463,10 €
<b>NON CURRENT LIABILITIES</b>	<b>- €</b>	<b>3.000,00 €</b>	<b>3.000,00 €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>
Loans	- €	3.000,00 €	3.000,00 €	- €	- €	- €
Other liabilities	- €	- €	- €	- €	- €	- €
<b>CURRENT LIABILITIES</b>	<b>10.742,15 €</b>	<b>8.863,53 €</b>	<b>28.487,66 €</b>	<b>76.410,05 €</b>	<b>132.124,14 €</b>	<b>141.032,30 €</b>
Suppliers	- €	- €	- €	- €	- €	- €
Other payables	5.108,82 €	5.974,53 €	14.973,20 €	3.835,50 €	4.941,89 €	2.434,07 €
Salaries payables	3.683,33 €	- €	- €	- €	- €	- €
Current tax liabilities	- €	- €	3.090,69 €	45.369,50 €	93.976,16 €	103.487,70 €
Public entites	1.950,00 €	2.889,00 €	10.423,77 €	27.205,05 €	33.206,09 €	35.110,53 €
<b>TOTAL LIABILITIES</b>	<b>128.216,36 €</b>	<b>32.087,78 €</b>	<b>69.225,81 €</b>	<b>371.242,02 €</b>	<b>708.884,59 €</b>	<b>1.028.255,84 €</b>

Table 49. Balance sheet in the average scenario. Source: own elaboration



## 11.5.2. Optimistic Scenario

### BALANCE SHEET

ASSETS	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
<b>NON CURRENT ASSETS</b>	<b>25.030,13 €</b>	<b>19.195,00 €</b>	<b>13.208,35 €</b>	<b>7.070,19 €</b>	<b>472,90 €</b>	<b>169,88 €</b>
Web site	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €
(Amortization)	-	3.642,75 € -	7.285,50 € -	10.928,25 € -	14.571,00 € -	14.571,00 €
App software	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €
(Amortization)	-	2.500,00 € -	5.000,00 € -	7.500,00 € -	10.000,00 € -	10.000,00 €
Office equipment	459,13 €	918,26 €	1.377,39 €	1.836,52 €	1.836,52 €	1.836,52 €
(Amortization)	-	151,51 € -	454,54 € -	909,08 € -	1.363,62 € -	1.666,64 €
<b>CURRENT ASSETS</b>	<b>104.342,03 €</b>	<b>48.624,40 €</b>	<b>270.175,84 €</b>	<b>894.280,35 €</b>	<b>1.589.470,80 €</b>	<b>2.235.939,89 €</b>
Goods for resale	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €
Trade receivable	7.653,25 €	8.984,25 €	22.516,08 €	5.767,60 €	7.431,41 €	3.660,25 €
Public entities (VAT)	- 1.636,42 €	- €	- €	- €	- €	- €
Cash	94.667,70 €	35.982,65 €	244.002,26 €	884.855,25 €	1.578.381,89 €	2.228.622,14 €
<b>TOTAL ASSETS</b>	<b>129.372,16 €</b>	<b>67.819,40 €</b>	<b>283.384,19 €</b>	<b>901.350,54 €</b>	<b>1.589.943,70 €</b>	<b>2.236.109,77 €</b>
<b>EQUITY AND LIABILITIES</b>						
<b>EQUITY</b>	<b>118.630,01 €</b>	<b>57.296,81 €</b>	<b>220.248,19 €</b>	<b>758.062,88 €</b>	<b>1.337.731,17 €</b>	<b>1.966.638,36 €</b>
Capital	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €
Share premium	200.000,00 €	200.000,00 €	200.000,00 €	200.000,00 €	200.000,00 €	200.000,00 €
Previous years results	- € -	84.369,99 € -	145.703,19 €	17.248,18 €	555.062,88 €	1.134.731,17 €
Profit and loss for the period	- 84.369,99 € -	61.333,20 €	162.951,38 €	537.814,69 €	579.668,29 €	628.907,19 €
<b>NON CURRENT LIABILITIES</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>
Loans	- €	- €	- €	- €	- €	- €
Other liabilities	- €	- €	- €	- €	- €	- €
<b>CURRENT LIABILITIES</b>	<b>10.742,15 €</b>	<b>10.522,59 €</b>	<b>63.136,00 €</b>	<b>143.287,66 €</b>	<b>252.212,53 €</b>	<b>269.471,42 €</b>
Suppliers	- €	- €	- €	- €	- €	- €
Other payables	5.108,82 €	5.974,53 €	14.973,20 €	3.835,50 €	4.941,89 €	2.434,07 €
Salaries payables	3.683,33 €	- €	- €	- €	- €	- €
Current tax liabilities	- €	- €	28.756,13 €	94.908,48 €	193.222,76 €	209.635,73 €
Public entites	1.950,00 €	4.548,06 €	19.406,68 €	44.543,69 €	54.047,88 €	57.401,62 €
<b>TOTAL LIABILITIES</b>	<b>129.372,16 €</b>	<b>67.819,40 €</b>	<b>283.384,19 €</b>	<b>901.350,54 €</b>	<b>1.589.943,70 €</b>	<b>2.236.109,77 €</b>

Table 50. Balance sheet in the optimistic scenario. Source: own elaboration

### 11.5.3. Pessimistic Scenario

BALANCE SHEET						
ASSETS	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024
<b>NON CURRENT ASSETS</b>	<b>25.030,13 €</b>	<b>19.195,00 €</b>	<b>13.208,35 €</b>	<b>7.070,19 €</b>	<b>472,90 €</b>	<b>169,88 €</b>
Web site	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €	14.571,00 €
(Amortization)	-	3.642,75 € -	7.285,50 € -	10.928,25 € -	14.571,00 € -	14.571,00 €
App software	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €	10.000,00 €
(Amortization)	-	2.500,00 € -	5.000,00 € -	7.500,00 € -	10.000,00 € -	10.000,00 €
Office equipment	459,13 €	918,26 €	1.377,39 €	1.836,52 €	1.836,52 €	1.836,52 €
(Amortization)	-	151,51 € -	454,54 € -	909,08 € -	1.363,62 € -	1.666,64 €
<b>CURRENT ASSETS</b>	<b>99.998,64 €</b>	<b>113.046,70 €</b>	<b>30.535,22 €</b>	<b>125.617,74 €</b>	<b>214.783,42 €</b>	<b>310.264,87 €</b>
Goods for resale	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €	3.657,50 €
Trade receivable	7.653,25 €	8.984,25 €	22.516,08 €	5.767,60 €	7.431,41 €	3.660,25 €
Public entities (VAT)	- 1.864,45 € -	1.731,14 €	- €	- €	- €	- €
Cash	90.552,34 €	102.136,09 €	4.361,64 €	116.192,64 €	203.694,51 €	302.947,12 €
<b>TOTAL ASSETS</b>	<b>125.028,77 €</b>	<b>132.241,70 €</b>	<b>43.743,57 €</b>	<b>132.687,93 €</b>	<b>215.256,32 €</b>	<b>310.434,75 €</b>
<b>EQUITY AND LIABILITIES</b>						
<b>EQUITY</b>	<b>114.286,62 €</b>	<b>123.378,17 €</b>	<b>24.613,48 €</b>	<b>99.650,29 €</b>	<b>178.143,48 €</b>	<b>261.145,21 €</b>
Capital	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €	3.000,00 €
Share premium	200.000,00 €	335.000,00 €	335.000,00 €	335.000,00 €	335.000,00 €	335.000,00 €
Previous years results	- € -	88.713,38 € -	214.621,83 € -	313.386,52 € -	238.349,71 € -	159.856,52 €
Profit and loss for the period	- 88.713,38 € -	125.908,45 € -	98.764,69 €	75.036,81 €	78.493,19 €	83.001,73 €
<b>NON CURRENT LIABILITIES</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>	<b>- €</b>
Loans	- €	- €	- €	- €	- €	- €
Other liabilities	- €	- €	- €	- €	- €	- €
<b>CURRENT LIABILITIES</b>	<b>10.742,15 €</b>	<b>8.863,53 €</b>	<b>19.130,09 €</b>	<b>33.037,64 €</b>	<b>37.112,84 €</b>	<b>49.289,54 €</b>
Suppliers	- €	- €	- €	- €	- €	- €
Other payables	5.108,82 €	5.974,53 €	14.973,20 €	3.835,50 €	4.941,89 €	2.434,07 €
Salaries payables	3.683,33 €	- €	- €	- €	- €	- €
Current tax liabilities	- €	- €	- €	13.241,79 €	13.851,74 €	27.667,24 €
Public entities	1.950,00 €	2.889,00 €	4.156,89 €	15.960,35 €	18.319,21 €	19.188,23 €
<b>TOTAL LIABILITIES</b>	<b>125.028,77 €</b>	<b>132.241,70 €</b>	<b>43.743,57 €</b>	<b>132.687,93 €</b>	<b>215.256,32 €</b>	<b>310.434,75 €</b>

Table 51. Balance sheet in the pessimistic scenario. Source: own elaboration

## 11.6. Dividends

When deciding whether it would be profitable to produce a product, or offer a service, companies normally do a breakeven analysis. This compares expected sales of the new product with expected cost (both direct and indirect) at various production lines. The breakeven point is the sales volume at which the company covers its cost (pays all its expenses). To make a profit, it is necessary to sell more than this.



The study of the dividends it is also done analyzing three different scenarios:

### 11.6.1. Average Scenario:

As during the third year the company will have positive cash flow, it is known that the breakeven point will be also in the third year. Having a positive cash flow means that the initial inversion is recovered and it is possible to start distributing dividends to the investors of BibApp.

Dividends distribution per partner per year:

Dividends	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	Total
Partner	-	-	-	30.160,66 €	93.976,16 €	103.487,00 €	227.623,82 €

Table 52. Dividends per partner per year in the average scenario. Source: own elaboration

Profitability of the investment:

	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	Total
Partner 1	-	-	-	3061,06%	9397,62%	10348,70%	22807,38%
Partner 2	-	-	-	3061,06%	9397,62%	10348,70%	22807,38%
Investor	-	-	-	15,23%	46,75%	51,49%	113,47%

Table 53. Probability of the investment in the average scenario. Source: own elaboration

### 11.6.2. Optimistic Scenario

In this case, the breakeven point will also during the third year. Following the same procedure as above in the average scenario it is also studied the dividends distribution per partner and per year and the profitability of the investment:

Dividends	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	Total
Partner	-	-	5.749,39 €	179.271,56 €	193.222,76 €	209.635,73 €	587.879,44 €

Table 54. Dividends per partner per year in the optimistic scenario. Source: own elaboration

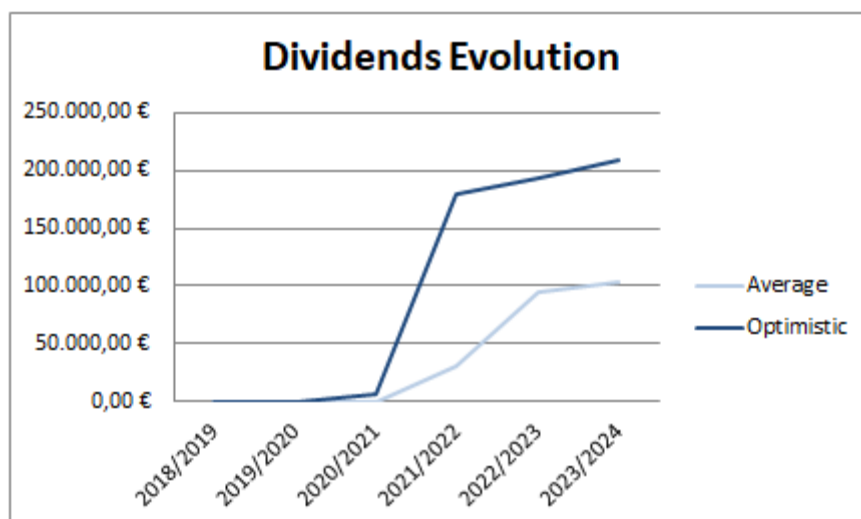
	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	Total
Partner 1	-	-	574,94%	17927,16%	19322,28%	20963,57%	58787,94%
Partner 2	-	-	574,94%	17927,16%	19322,28%	20963,57%	58787,94%
Investor	-	-	2,86%	89,19%	96,13%	104,30%	292,48%

Table 55. Probability of the investment in the optimistic scenario. Source: own elaboration

### 11.6.3. Pessimistic Scenario

Finally, it has been done the same study for the pessimistic scenario. In the profit and loss and the balance sheet of this scenario, it can be seen that the equity is lower than the capital and the share premium because there are still negative results from previous years exercises, without being compensate. Thus, dividends cannot be distributed.

Given the evolution of the profit and loss account, it is expected to compensate the negative results during the following year and be able to proceed to the distribution of dividends.



Graphic 52. Dividends evolution in the pessimistic scenario. Source: own elaboration



## 11.7. NPV, IRR and Payback

### 11.7.1. Average Scenario

NPV (Net Present Value)

$$NPV = -200.000 + \frac{-85.525,79}{(1 + 0,1)} + \frac{-90.955,70}{(1 + 0,1)^2} + \frac{23.959,67}{(1 + 0,1)^3} + \frac{263.691,10}{(1 + 0,1)^4} + \frac{288.525,75}{(1 + 0,1)^5} + \frac{310.766,12}{(1 + 0,1)^6} = 199.756,27\text{€}$$

IRR (Internal Rent of Return)

$$IRR = -200.000 + \frac{-85.525,79}{(1 + i)} + \frac{-90.955,70}{(1 + i)^2} + \frac{23.959,67}{(1 + i)^3} + \frac{263.691,10}{(1 + i)^4} + \frac{288.525,75}{(1 + i)^5} + \frac{310.766,12}{(1 + i)^6} = 0,00\text{€}$$

$$i = 22\%$$

PAYBACK

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash Flow	-200.000,00 €	-85.525,79 €	-90.955,70 €	23.959,67 €	263.691,10 €	288.525,75 €	310.766,12 €
Gathered Cash Flow	-200.000,00 €	-285.525,79 €	-376.481,49 €	-352.521,82 €	-88.830,72 €	199.695,04 €	510.461,16 €

Table 56. Cash flow in the average scenario. Source: own elaboration

$$Payback = 4 + \frac{|-88.830,72|}{288.525,75} = 4,31 \text{ years}$$

NPV	199.756,27 €
IRR	22%
Payback	4,31

Table 57. NPV, IRR and Payback in the average scenario. Source: own elaboration

### 11.7.2. Optimistic Scenario

NPV (Net Present Value)

$$NPV = -200.000 + \frac{-84.369,99}{(1 + 0,1)} + \frac{55.038,94}{(1 + 0,1)^2} + \frac{169.397,15}{(1 + 0,1)^3} + \frac{544.411,97}{(1 + 0,1)^4} + \frac{586.266,57}{(1 + 0,1)^5} + \frac{629.021,21}{(1 + 0,1)^6} = 896.122,12\text{€}$$

IRR (Internal Rent of Return)

$$IRR = -200.000 + \frac{-84.369,99}{(1 + i)} + \frac{55.038,94}{(1 + i)^2} + \frac{169.397,15}{(1 + i)^3} + \frac{544.411,97}{(1 + i)^4} + \frac{586.266,57}{(1 + i)^5} + \frac{629.021,21}{(1 + i)^6} = 0,00\text{€}$$

$$i = 51\%$$

PAYBACK

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash Flow	-200.000,00 €	-84.369,99 €	-55.038,94 €	169.397,15 €	544.411,97 €	586.265,57 €	629.210,21 €
Gathered Cash Flow	-200.000,00 €	-284.369,99 €	-339.408,93 €	-170.011,79 €	374.400,19 €	960.665,76 €	1.589.875,97 €

Table 58. Cash flow in the optimistic scenario. Source: own elaboration

$$Payback = 3 + \frac{|-170.411,79|}{544.411,97} = 3,31 \text{ years}$$

NPV	896.122,12 €
IRR	51%
Payback	3,31

Table 59. NPV, IRR and Payback in the optimistic scenario. Source: own elaboration





### 11.7.3. Pessimistic Scenario

NPV (Net Present Value)

$$NPV = -335.000 + \frac{-88.713,38}{(1 + 0,1)} + \frac{-119.614,19}{(1 + 0,1)^2} + \frac{-92.318,92}{(1 + 0,1)^3} + \frac{81634,09}{(1 + 0,1)^4} + \frac{85.090,47}{(1 + 0,1)^5} + \frac{83.304,75}{(1 + 0,1)^6} = 1.976,22€$$

IRR (Internal Rent of Return)

$$IRR = -335.000 + \frac{-88.713,38}{(1 + i)} + \frac{-119.614,19}{(1 + i)^2} + \frac{-92.318,92}{(1 + i)^3} + \frac{81634,09}{(1 + i)^4} + \frac{85.090,47}{(1 + i)^5} + \frac{83.304,75}{(1 + i)^6} = 0,00€$$

$$i = 12\%$$

PAYBACK

The payback cannot be estimated as the study has been done with the first six years and the payback is in a subsequent year.

As it has been explained in the dividends section, having a look at the profit and loss study in the pessimistic scenario, during these first years, the company will not be profitable, but numbers are becoming better as years pass. If a longer period of time will have been studied, the company would have been profitable.



## Conclusions

BibApp wants to take advantage of the current situation, an idea whose full potential has not been used yet. With the design and business plan we have carried out we can clearly see the opportunity BibApp has in the sector.

The main goal of this project was to study in the most realistic scenario possible, the possibility to apply this idea to the sector of smartphone application. During the developing process of the project we have noticed that, indeed, the creation of a company dedicated to offering this kind of service to our users would be more than possible.

With the study of the weaknesses and strengths of BibApp we have been able to verify how, despite the complexity and the possible difficulties that could appear from a logistic point of view, it would be possible to keep operating a service able to satisfy all the users' necessities.

On the other hand, the design of the application has allowed us to know in depth the internal processes of mobile applications and the complexity that lies behind the intuitive interfaces that we use in our everyday lives.

In short, this work has allowed us to study the operation of the business model a start up in the sector of location and data based services and the possibility of applying it successfully as a method to inform the users about libraries' occupancy.



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